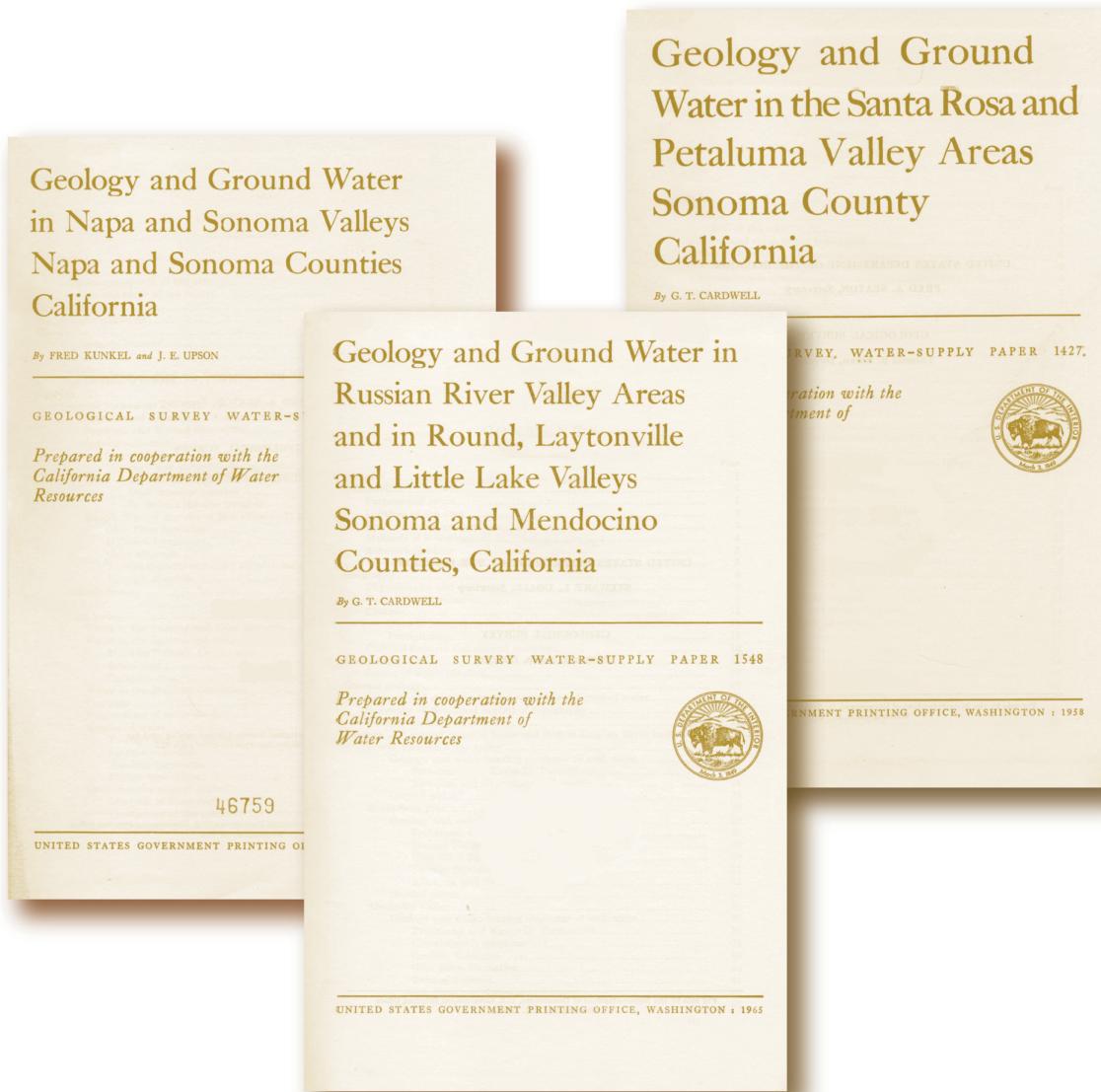




# Digital Tabulation of Geologic and Hydrologic Data from Water Wells in the Northern San Francisco Bay Region, Northern California

By D.S. Sweetkind and E.M. Taylor



Open-File Report 2010-1063

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## Conversion Factors

SI to Inch/Pound

Multiply	By	To obtain
Length		
centimeter (cm)	0.3937	inch (in)
millimeter (mm)	0.03937	inch (in)
meter (m)	3.281	foot (ft)
kilometer (km)	0.6214	mile (mi)
Area		
square meter ( $m^2$ )	0.0002471	acre
square kilometer ( $km^2$ )	247.1	acre
Flow rate		
liter per second (L/s)	15.85	gallon per minute (gal/min)
cubic meter per day ( $m^3/d$ )	264.2	gallon per day (gal/d)

Temperature in degrees Fahrenheit ( $^{\circ}F$ ) may be converted to degrees Celsius ( $^{\circ}C$ ) as follows:

$$^{\circ}C = (^{\circ}F - 32) / 1.8$$

Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88).

Horizontal coordinate information is referenced to the North American Datum of 1927 (NAD 27).

Elevation, as used in this report, refers to distance above the vertical datum.

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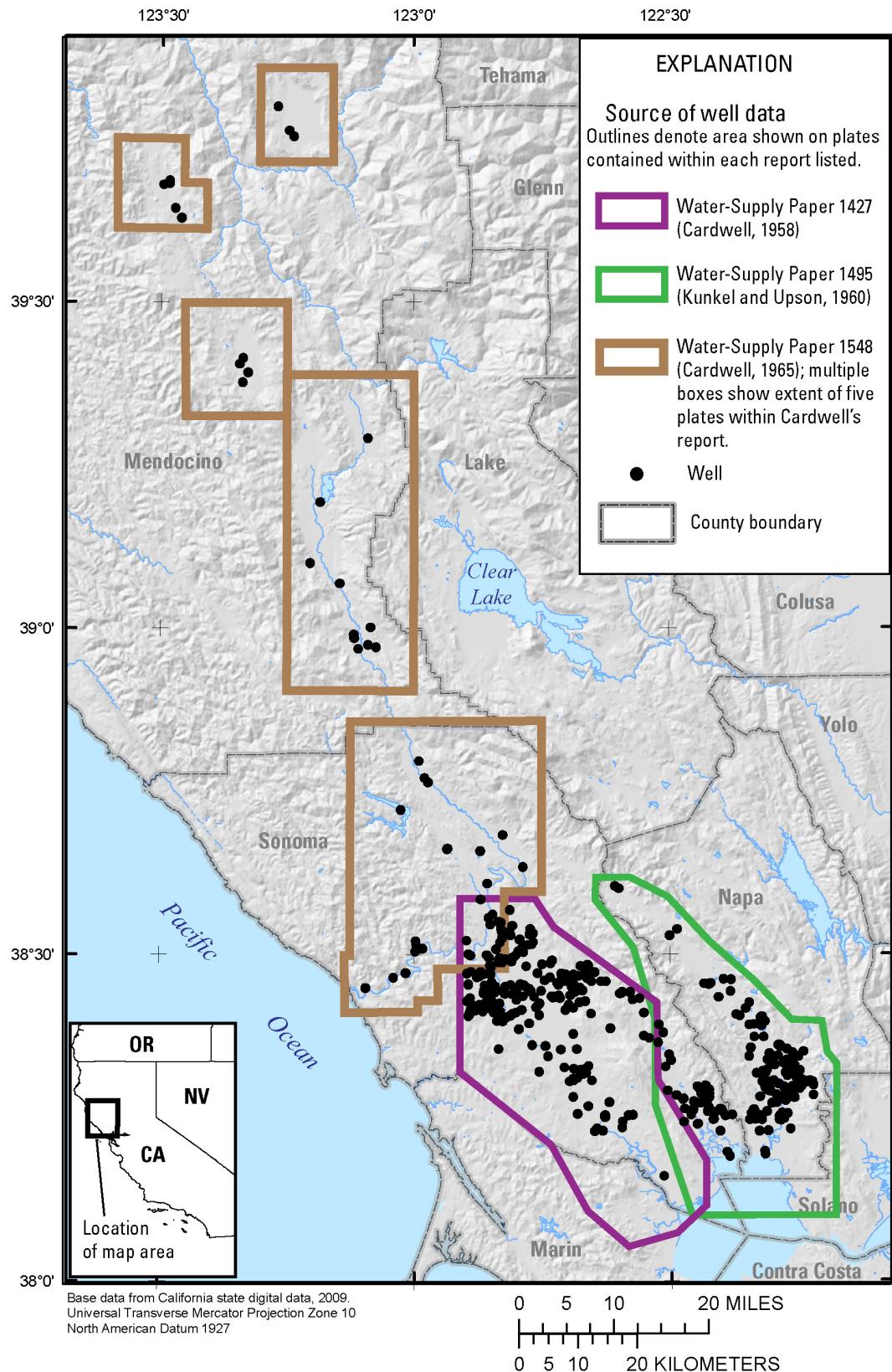
## **Abstract**

Downhole lithologic information and aquifer pumping test data are reported from 464 wells from a broad area of the northern part of the Coast Ranges in California. These data were originally published in paper form as numerous tables within three USGS Water-Supply Papers describing geology and groundwater conditions in Napa and Sonoma Valleys, the Santa Rosa and Petaluma Valley areas, and in the Russian River Valley and areas in Sonoma and Mendocino Counties, Calif. The well data are compiled in this report in digital form suitable for use in a digital mapping environment. These data, although mostly from relatively shallow water wells, provide important subsurface information that displays the disposition and facies transition of lithologic units throughout this broad area. Well lithologic data themselves and simple three-dimensional interpolation of those data show distinct spatial patterns that are linked to subsurface stratigraphy and structure and can be used to aid in the assessment of the groundwater resources.

## **Introduction**

In this Open-File report we compile in digital form geologic and hydrologic data from water wells in a broad area of the northern part of the Coast Ranges in California. These data were originally published as numerous tables within three USGS Water-Supply Papers describing geology and groundwater conditions in Napa and Sonoma Valleys (Kunkel and Upson, 1960), the Santa Rosa and Petaluma Valley areas (Cardwell, 1958), and in the Russian River Valley and areas in Sonoma and Mendocino Counties, Calif. (Cardwell, 1965) (fig. 1).

The northern part of the San Francisco Bay area has experienced rapid population growth and urbanization in recent decades. Resulting changes in land use within Sonoma County and the northern Coast Ranges require an understanding of subsurface geologic conditions and aquifer properties to aid in the assessment of the groundwater resources (California Department of Water Resources, 1982). The digital data compiled here are suitable for incorporation within a geographic information system (GIS) and for use in construction of three-dimensional (3D) geologic framework models that can be used to address these issues.



**Figure 1.** Location of well data described in three Water-Supply papers.

This data tabulation includes all downhole lithologic information and aquifer pumping test data from 464 wells ([plate 1](#); [appendices 1–3](#)) described in the three USGS Water-Supply Papers (Cardwell, 1958; Kunkel and Upson, 1960; Cardwell, 1965) (fig. 1). A subset of these data, tabulating the lithology present at the water table for wells only in the Santa Rosa Valley area, was previously released by Valin and McLaughlin (2005).

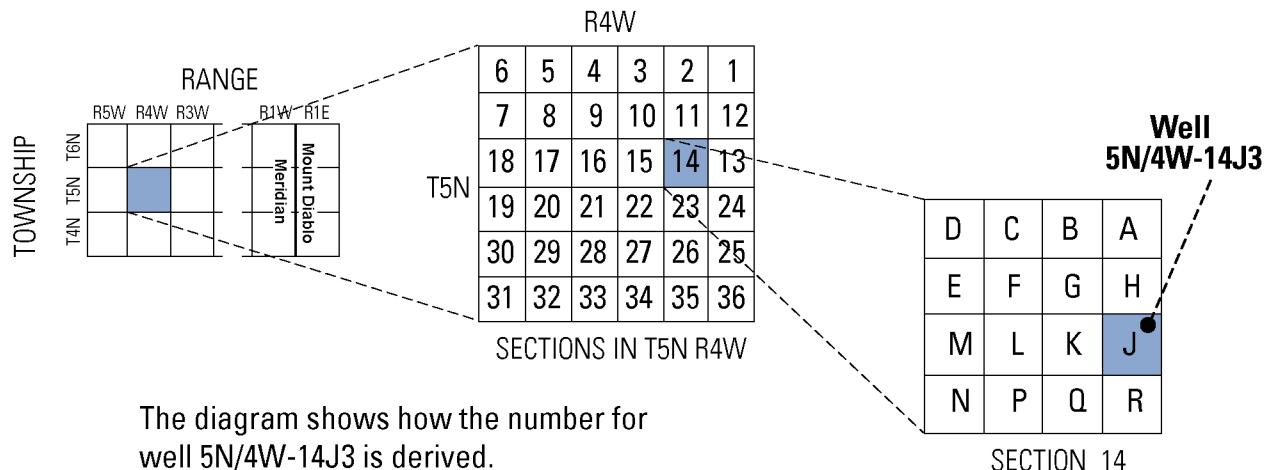
## Data-Compilation Methodology

In the three USGS Water-Supply Papers (Cardwell, 1958; Kunkel and Upson, 1960; Cardwell, 1965) and in this report, a well is defined as subsurface excavation or boring intended to be used to locate, sample, or develop groundwater or other material. Many of the wells have multiple zones of perforations, but for the purposes of this report these are considered to be all in the same well.

The focus of our data transcription was on wells that had downhole lithologic data and that had lithologic or stratigraphic information reported from the water-bearing interval ([appendices 1–3](#)). There remain a number of data sets and tables from the three USGS Water-Supply Papers (Cardwell, 1958; Kunkel and Upson, 1960; Cardwell, 1965) that we did not transcribe, including water levels on wells for which no geologic data were reported and tables of water chemistry data. Our emphasis was on compiling subsurface geologic information and not necessarily in creating an exhaustive and complete transcription of these three published reports.

## Well Location

The well-numbering system used in the three USGS Water-Supply Papers ([appendix 1](#)) locates the water wells according to their location in the rectangular system for the subdivision of public lands. Identification consists of the township number, north or south; the range number, east or west; and the section number (fig. 2). Each section is divided into sixteen 40-acre tracts lettered consecutively (except I and O), beginning with "A" in the northeast corner of the section and progressing in a boustrophedonic manner to "R" in the southeast corner. Within the 40-acre tract, wells are numbered sequentially in the order they are inventoried. Many valley areas were privately acquired through land grants made by the Spanish or Mexican Governments and have never been formally surveyed into sections ([plate 1](#)). In order to locate wells in these areas, we subdivided these areas for reference purposes only by extending survey lines from adjacent areas or by superimposing an arbitrary land grid.



**Figure 2.** Public lands survey and well-numbering system.

However, most of the well locations in the original studies were field-checked so that the wells were located with greater accuracy than the township-range-section designation. It was these field-checked locations that were plotted on the plates that accompany each Water-Supply paper and on this report's plate 1. Longitude and latitude coordinates for the wells were not published in the original reports. These well locations were determined by digitizing the well locations plotted on each map plate ([appendix 1](#)). Paper copies of plates showing well locations were scanned to a digital raster image and spatially referenced in a GIS using a digital topographic base. Well locations were digitized from the spatially referenced images. Accuracy of the digitized well locations is estimated in most cases to be within 50 meters (m) of the plotted location. Well elevation and total drilled depth are transcribed directly from the source reports ([appendix 1](#)).

## Lithologic Descriptions

Two types of lithologic data were presented in the three USGS Water-Supply Papers (Cardwell, 1958; Kunkel and Upson, 1960; Cardwell, 1965). Subsurface lithologic descriptions were presented in all three reports for each drilled downhole interval for a certain number of wells. These data are tabulated in appendix 3. In addition, in the Santa Rosa and Petaluma Valley areas (Cardwell, 1958) lithologic descriptions were reported for the water-bearing interval for those wells that had hydrologic data. These data are compiled in appendix 2 as part of the hydrologic data. For all of these data, the lithologic descriptions are those provided by the well driller and comprise a vast array of descriptive terms. Drillers' descriptions are generally short phrases that accompany a significant lithologic change. Typically, descriptions range from one to ten words that describe a change recognized by the driller as they penetrate a different unit; for example, descriptions may include information on grain size, presence or absence of gravel or large rocks, degree of consolidation, and rock type or abrupt color changes. Although the driller's descriptions can vary in length, detail, and accuracy, they are the fundamental geologic data set that was collected at the drill site. We preserve these descriptions exactly as they were originally reported by the drillers, as tabulated in the three USGS Water-Supply Papers (Cardwell, 1958; Kunkel and Upson, 1960; Cardwell, 1965). In appendixes 2 and 3 these basic descriptions are listed as "reported lithologic unit" or "reported geologic unit" and are clearly separated from our interpretations.

Drillers' descriptions were simplified to a small number of internally consistent lithologic classes (table 1) for all 464 wells. We assigned each described interval to a lithologic class based on our knowledge of the range of sediment types gained from observation of surface outcrops, lithologic descriptions from published reports (Allen, 2003; Davies, 1986; Powell and others, 2004; Wagner and others, 2005), similarity to more detailed subsurface descriptions (Powell and others, 2006), and on comparisons of downhole intervals in adjacent wells. Sediments were subdivided on the basis of grain size or mixtures of size classes. We attempted to recognize the degree of cementation or induration from driller's descriptions. This was possible in the sandy part of the section, where sand could be reliably separated from sandstone, but proved impossible for the coarse-grained fraction, where large clast size sometimes interfered with a driller's assessment of induration. Stratigraphic order and character of overlying and underlying intervals were considered in classifying the lithologic descriptions. Volcanic rocks were divided into two categories: (1) basaltic lava flows, and (2) ash or tuff. Basalts were assumed to be readily identified by the drillers, so these were split from the rest of the volcanic intervals.

**Table 1.** Generalized lithologic classes based on driller's descriptions.

Lithology class	Typical drillers' description
Gravel	Boulders; cemented gravel; gravel; loose rock; rock (if surrounded by clay and gravel and is less than 5 ft thick); rubble.
Sand (or sandstone) and gravel	Alluvial deposits; clayey sand and gravel; clayey sand with minor gravel or streaks of gravel; gravel and (or with) streaks of clay; gravel with sand and clay; sand and gravel; sand and gravel with clay; sand and rock; silty gravel; surface and boulders; cemented sand and gravel; sandstone and gravel.
Sand	Blue, gray, red, or yellow sand; sand; shells (as only descriptor of interval).
Sandstone	Blue rock; graywacke; sand rock; sandstone; cemented sand; rock (when surrounded by shelly or sandstone layers); sand and ledges; sandy rock.
Sand and clay <sup>1</sup>	Adobe; clay sandstone; loam; quicksand; sand and clay; sand and shale; soil; silt; sticky sand; surface; topsoil.
Clay, sand, and gravel <sup>2</sup>	Clay, sand and gravel; conglomerate and agglomerate; gravel, sand and shale; sandy clay and gravel; shale and gravel; shale and rock; topsoil and gravel or rock.
Clay, sand, and trace gravel	Sandy clay and streaks of gravel; shale and boulders; shale and gravel; silty clay and some gravel; clay and little gravel; clay and some boulders; clay and some gravel; clay and streaks gravel; clay with gravel stringers.
Clay and gravel <sup>3</sup>	Boulders in clay; cemented gravel and clay; clay and boulders; clay, gravel; clay with conglomerate; clay and rock; clayey sand and gravel; embedded clay or gravel; gravel and clay; gravelly clay; hardpan.
Clay and sand (or sandstone)	Basin deposits; clay and sand; clay and shale; clay and silt; mud; diatomite; mudstone; sand clay (brown, blue, green, orange, and yellow); sandy clay; silt; silty clay; shale; shale and sand; clay and sandstone; gray rock when surrounded by shale; sandy claystone; siltstone.
Clay	Clay, typically described as black, blue, brown, gray, green, tan, or yellow.
Basalt	Andesite; basalt; basalt and cinders; basalt and lava; basalt and sand; basalt boulders; black ash; black volcanic rock; cinders; diorite; lava rock; porous volcanic rock.
Ash and(or) tuff	Altered ash; ash (with color descriptors blue, brown, gray, red, white, or yellow); ash flow tuff; broken rock; clay and ash; lava ash; conglomerate and volcanic rock; multicolored rock; pumice rock; rock (where described as red or black, or when surrounded by rocks that are described as volcanic).
Undifferentiated basement <sup>4</sup>	Serpentine; basalt and serpentine; basalt and shale; black rock with quartz; blue and green rock or clay when surrounded by graywacke, shale or serpentine; oily rock; rock with quartz and blue or green rock, shale or clay; all units below any interval identified as serpentine, especially where described as green and blue.
No data	No data, rock (when not surrounded by volcanic units and greater than 5 ft thick).

<sup>1</sup> Sand and clay are most common at the shallowest depths and most commonly represent the soil profile.

<sup>2</sup> Conglomerate and agglomerate in some cases may refer to volcanic rocks. Rocks with these descriptors are included with volcanic rocks where surrounding intervals also appear to be volcanic rocks.

<sup>3</sup> Clay and gravel, in some cases, may be weathered ash and volcanic rocks, but the distinction cannot be made without additional descriptors or stratigraphic context.

<sup>4</sup> Only units at depth are considered. When an interval at shallow depth is described by any of these terms other than serpentine and the underlying intervals are not described as basement, this zone is not described as undifferentiated basement. Although undifferentiated basement is only used at depth in a drill hole, on rare occasion the Franciscan Complex is thrust over the Glen Ellen Formation, such as along the Trenton fault near the Russian River.

## Stratigraphic Descriptions

The three USGS Water-Supply Papers (Cardwell, 1958; Kunkel and Upson, 1960; Cardwell, 1965) reported interpreted subsurface stratigraphy and name-specific geologic formations with the downhole lithologic interval data and with the geologic description of the water-bearing interval. We tabulated these formation picks as they appeared in the original reports and compiled the data in appendix 2. In addition, we have chosen to create a series of generalized stratigraphic unit classes which generally correspond to recognized stratigraphic units but do not require us to make specific formational assignments in the absence of subsurface control or detailed stratigraphic studies (table 2). In order to display well data in a simple fashion, rocks intercepted in the subsurface were classified into the following generalized stratigraphic unit classes: Mesozoic rocks, undifferentiated; Paleogene marine sedimentary rocks; Neogene continental sedimentary rocks; Neogene volcanic rocks; Neogene marine sedimentary rocks; Neogene to Quaternary continental deposits; and Quaternary continental deposits (table 2, [appendix 2, plate 1](#)).

In the northern California Coast Ranges, Mesozoic rocks of the Franciscan Complex, the Great Valley sequence, and the Coast Range ophiolite make up the basement. In the eastern part of the study area, the Mesozoic basement is overlain by Paleogene marine formations ([plate 1](#)). In the southern Napa Valley and to the east of Sonoma Valley, Neogene marine strata of the San Pablo Group overlie the basement. Because these rocks locally underlie the Sonoma Volcanics, we have included them with the older Paleogene marine sedimentary rocks ([plate 1](#)).

**Table 2.** Description of simplified stratigraphic units.

Generalized stratigraphic unit class	General age range <sup>1</sup>	Examples of mapped geologic units <sup>2</sup>	Estimated thickness, in meters	Typical depositional environment <sup>4</sup>	Typical lithologic description
Quaternary continental deposits (Qal)	Quaternary	Includes units mapped as younger and older alluvium and alluvial fan and terrace deposits	0–60	Stream-channel, flood-plain deposits, older alluvium and terrace deposits	Gravel; sand and gravel; sand, clay, and gravel; sand and clay
Neogene to Quaternary continental deposits (QTc)	Early Pleistocene(?) and Pliocene	Includes the Glen Ellen Formation, the Huichica Formation, and other unnamed Tertiary continental deposits	0–900	Continental, piedmont, and valley alluvial fans, local lacustrine deposits	Clay and sand; clay and gravel; sand; sand and gravel; tuff; conglomerate
Neogene marine sedimentary rocks (Twg)	Late Miocene to late Pliocene	Includes the Ohlson Ranch and Wilson Grove Formations, and rocks formerly assigned to the Merced Formation	0–1,800	Deep to shallow marine, locally transitional to continental environments.	Sand, sandstone, blue sandstone; clay, sand or gravel and shells; clay and sand
Neogene <sup>5</sup> volcanic rocks (Tv)	Pliocene and Miocene	Includes Sonoma and Tolay Volcanics, and volcanics of Burdell Mountain	0–600	---	Basalt; volcanic breccia; tuff
Neogene continental sedimentary rocks (Tp)	Pliocene to late Miocene	Includes the Petaluma Formation	0–1,200	Fluvial and lacustrine, with estuarine and transitional marine environment	Clay; clay and sand; shale; sand or sandstone
Paleogene marine sedimentary rocks (Tu)	Eocene to Miocene	Includes units such as the Neroly Formation and the Markley Sandstone <sup>3</sup>	0–>1,200	---	Sandstone, shale
Mesozoic rocks, undifferentiated (KJu)	Pre-Miocene; predominantly Jurassic and Cretaceous	Includes the Franciscan Complex, the Great Valley sequence, including the Coast Range ophiolite	>2,000	---	Sandstone, graywacke, chert, serpentine

<sup>1</sup>General age ranges from Wagner and Bortungo (1982); Blake and others (2002); Graymer and others (2002).

<sup>2</sup>Mapped geologic units from Wagner and Bortungo (1982); Blake and others (2002); Graymer and others (2002); Graymer and others (2007).

<sup>3</sup>Wagner and Bortungo (1982) and Blake and others (2002) describe Eocene and Miocene sedimentary rocks in the region.

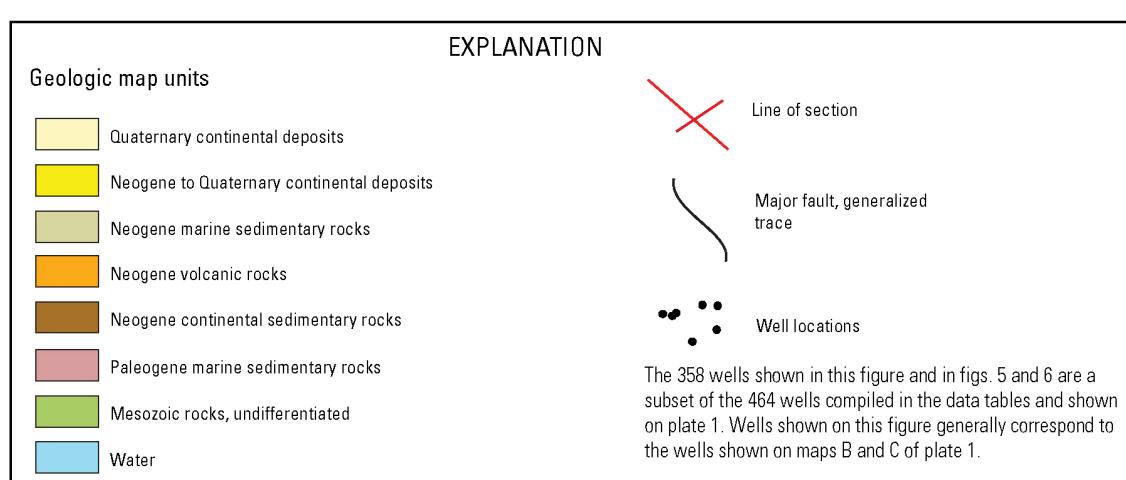
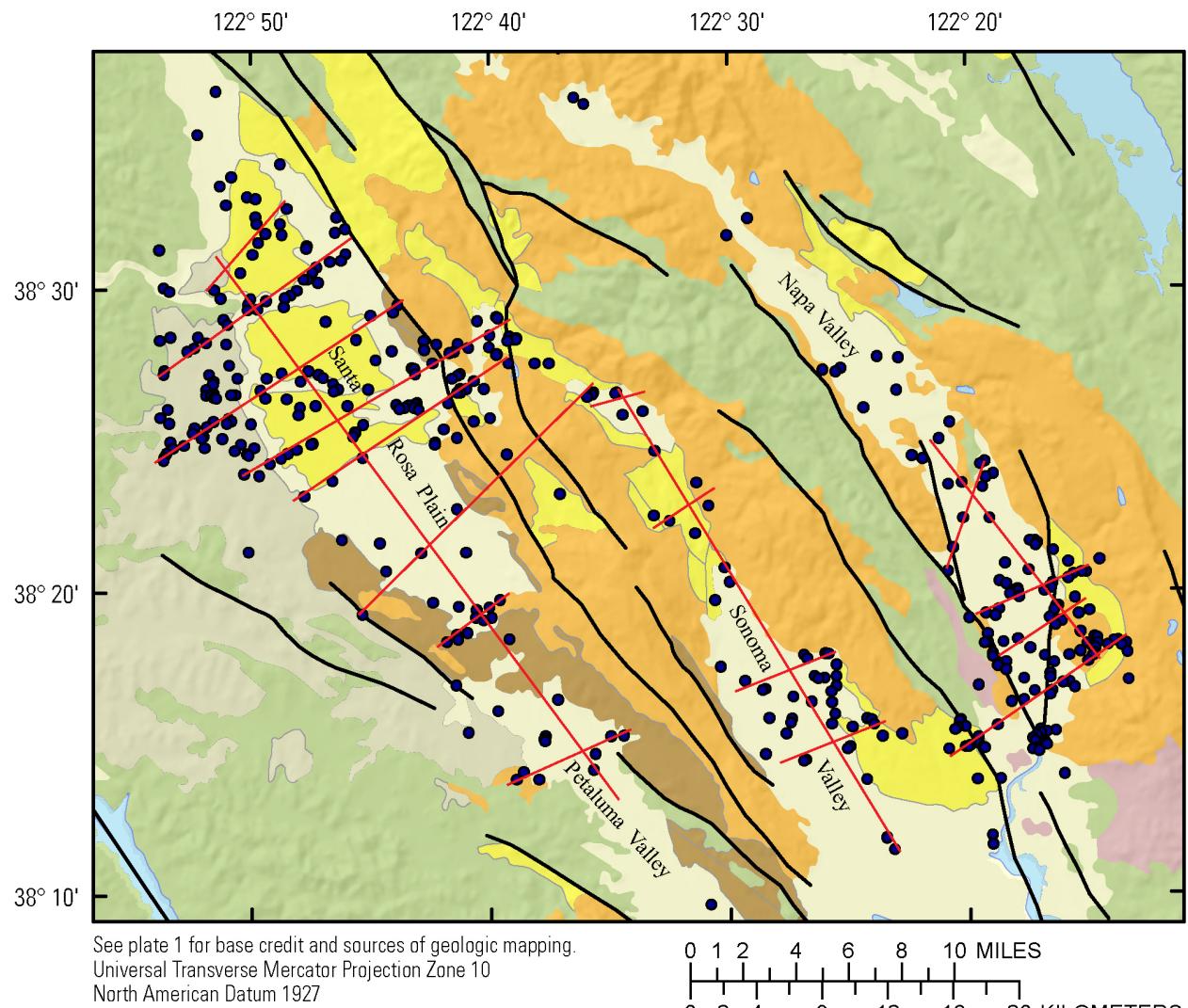
<sup>4</sup>Depositional environment listed only for Miocene and younger sedimentary rocks.

<sup>5</sup>May locally include Quaternary volcanic rocks from the Clear Lake volcanic field.

Cenozoic basins developed above these older rocks as a response to tectonic processes at the plate margin (Fox, 1983; McLaughlin and others, 1996). The Neogene volcanic rocks of the northern San Francisco Bay region are part of a linear belt of volcanic fields that are progressively younger to the northwest (Fox, 1983) and are roughly coeval with basin formation and fault motion in the region. Neogene sedimentary rocks include the Petaluma Formation, mostly continental rocks with some transitional marine deposits, and the marine sandstones such as the Wilson Grove Formation. Rocks of the Petaluma Formation interfinger with both Neogene volcanic rocks and with the marine sandstones such as the Wilson Grove Formation. Overlying these rocks are younger continental gravels such as the Glen Ellen Formation and similar deposits.

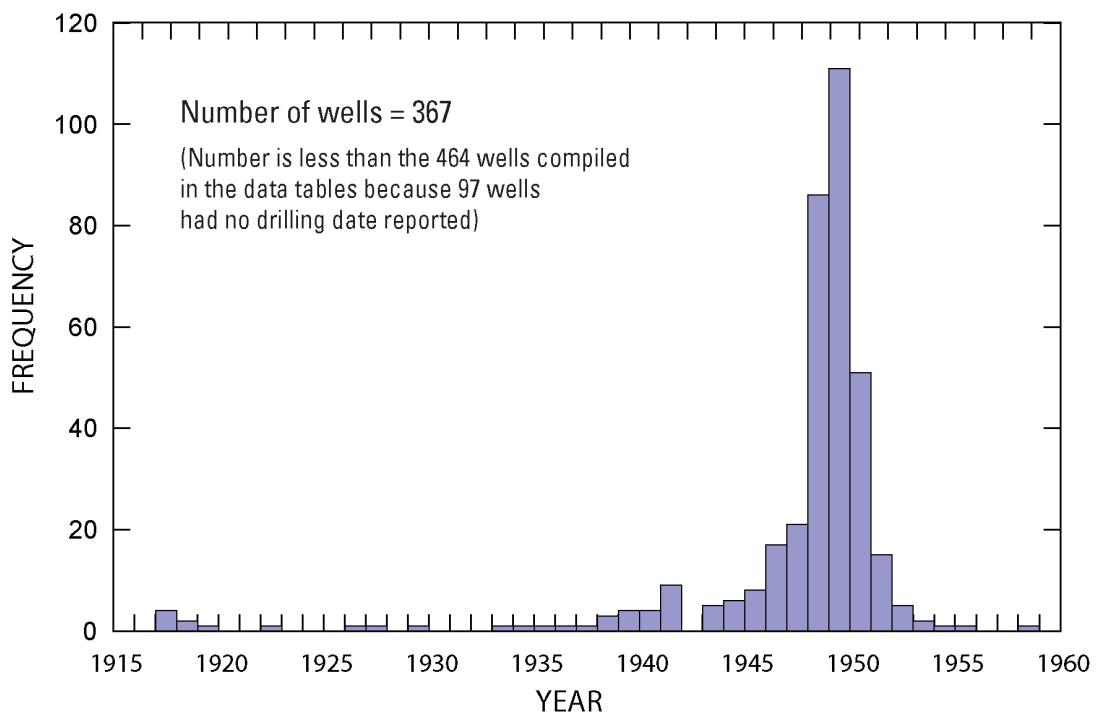
## Visualization of Lithologic and Stratigraphic Data

The relatively dense clustering of 358 wells in the Santa Rosa, Sonoma and Napa Valleys (fig. 3) was used to construct a 3D lithologic model of the region in order to help visualize the spatial distribution of subsurface lithologic data. The wells used in the visualization were drilled between 1918 and 1960, with the majority drilled in the 1950s (fig. 4A). Most of the wells were drilled for residential use, which at the time was predominantly in the valleys rather than the surrounding mountains. The total drilled depth of these wells varied from 6 to 633 m; the average total depth was about 100 m (fig. 4B). Wells were located by latitude and longitude, as described above, and the elevation of the well was derived from a 30-m digital elevation model (DEM).

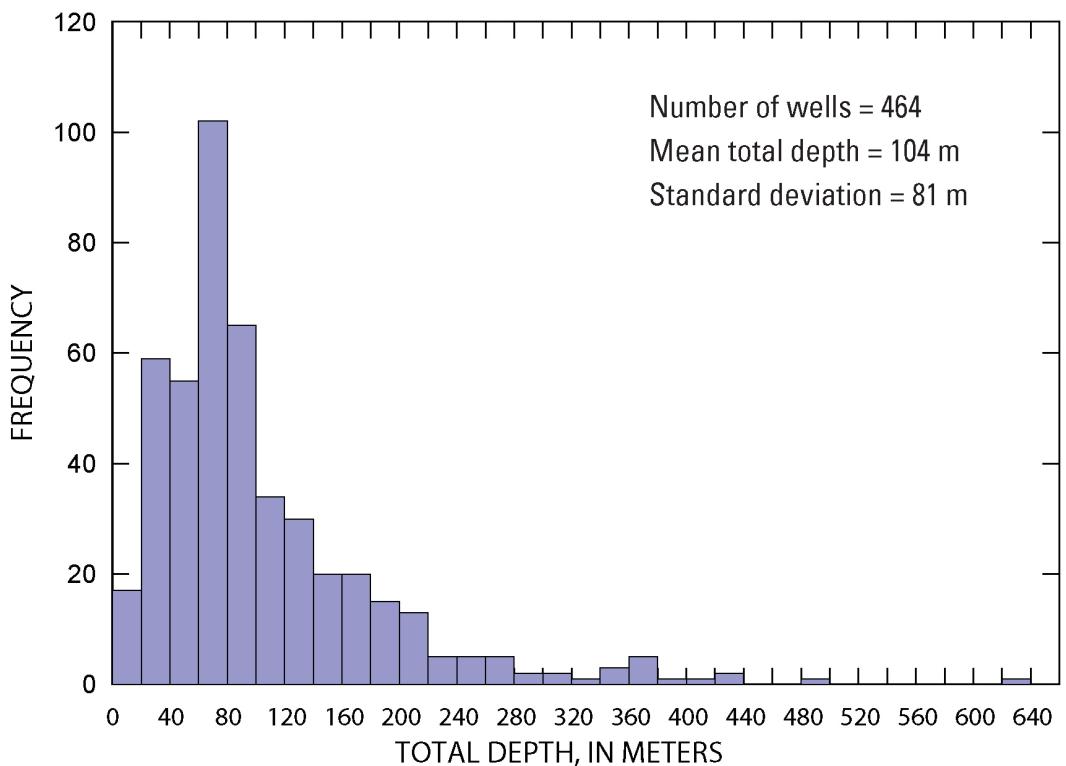


**Figure 3.** Topographic and simplified geologic maps of the Santa Rosa, Sonoma, and Napa Valleys showing well and vertical section locations.

### A. Frequency of wells drilled between 1918 and 1959



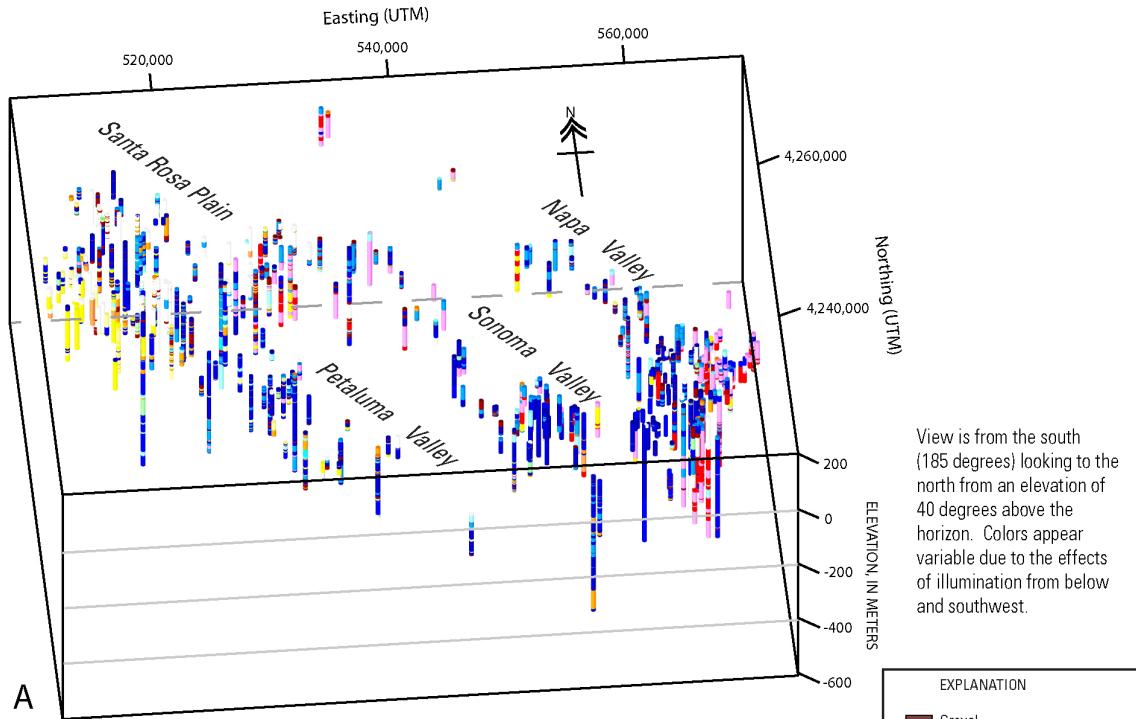
### B. Total drilled depth of wells



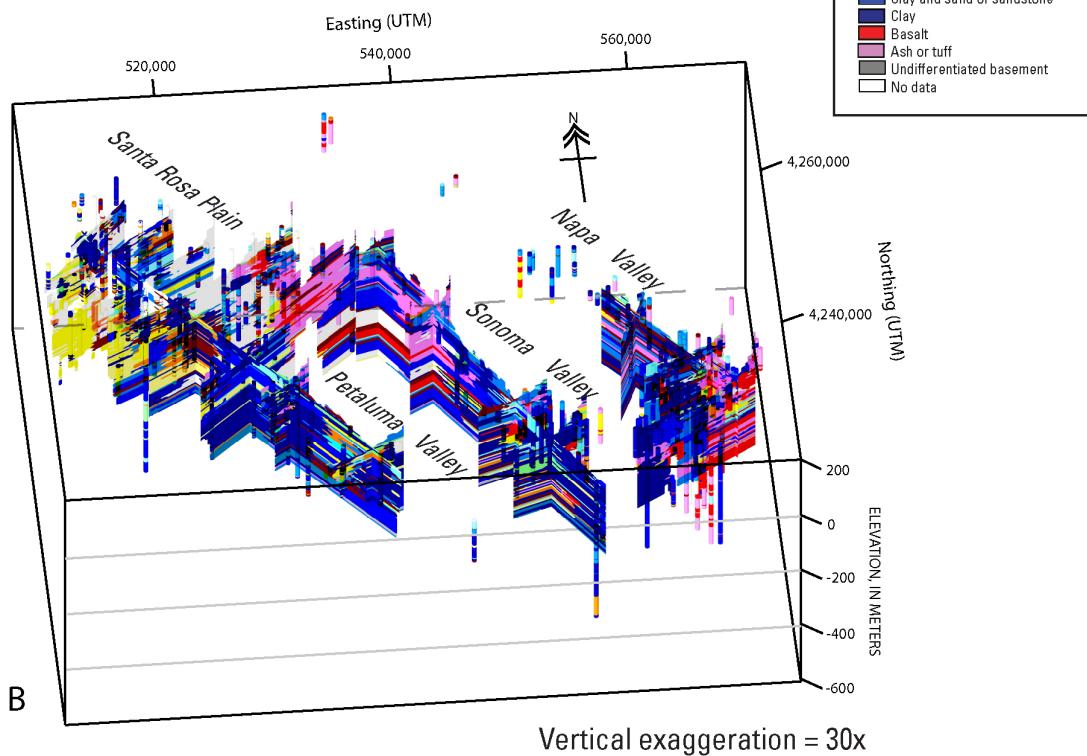
**Figure 4.** Frequency of (A) the number of wells drilled between 1918 and 1960 and (B) the total depth of the wells used to construct the 3D lithologic model.

## **Method for Construction of the Lithologic Model**

The 3D distribution of subsurface lithologic data was illustrated by constructing a 3D lithologic solid model of the area. Drillers' descriptions were simplified to a small number of internally consistent lithologic classes (table 1) for all 358 wells. Interpreted well lithologic data were numerically interpolated between wells by using a cell-based, 3D gridding process using the RockWorks 3D modeling software package (<http://www.rockware.com/> accessed October, 2010). In this method, a solid modeling algorithm is used to extrapolate numeric codes that represent a lithologic class onto grid nodes throughout the 3D-model domain. Grid nodes between wells are assigned lithologic class values based on the relative horizontal proximity of each grid node to surrounding wells. Cell dimensions for the 3D interpolation were 500 m in the horizontal dimensions and 5 m in the vertical dimension. The solid model was constructed to 620 m below the surface, but trimmed at depth to 250 m to eliminate the modeling artifacts resulting from a few deep wells controlling the model results at greater depths. The upper surface of the solid model was trimmed with the DEM. The 3D distribution of lithologic classes within the solid model may be visualized by displaying a number of vertical cross sections sliced through the solid model (figs. 5 and 6).

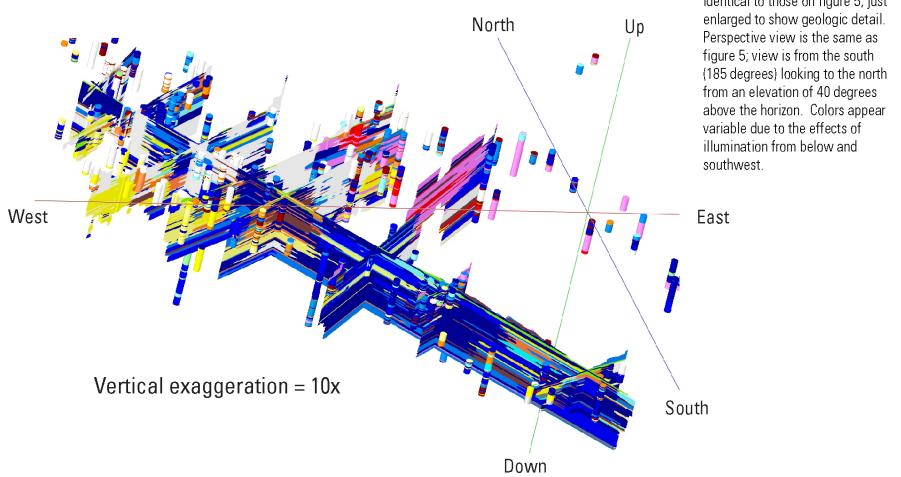


Cylinders represent the location and drilled interval of wells; colors represent lithologic units intercepted downhole. Drill holes are hung from their collar elevation at land surface. Land surface is transparent; as a result, the drill holes have the appearance of hanging in space. Location of drill holes and map extent of the upper surface of the 3D volume shown in figure 3.

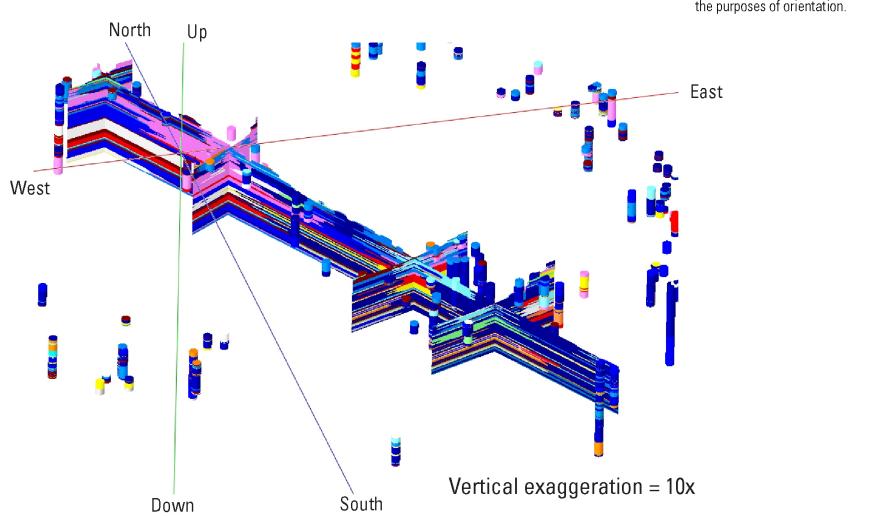


**Figure 5.** Three-dimensional portrayals of (A) well lithologic data and (B) well data with vertical sections in Santa Rosa, Sonoma, and Napa Valleys.

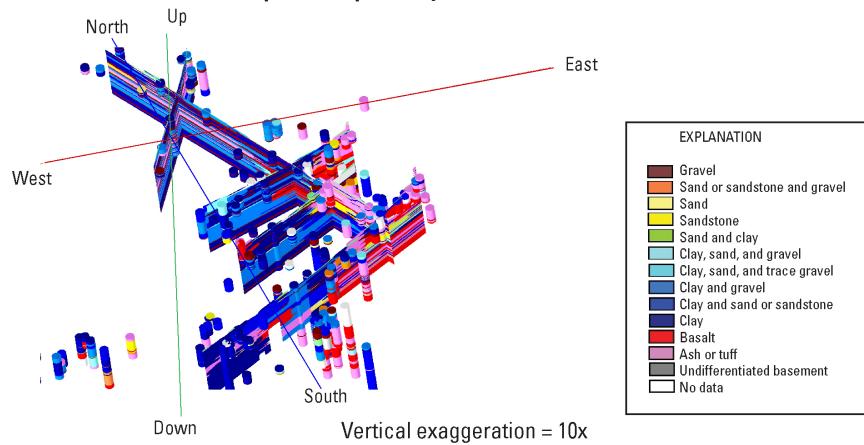
### A. Detail of Santa Rosa Valley



### B. Detail of Sonoma Valley



### C. Detail of the southern part of Napa Valley



**Figure 6.** Detail of well data and vertical sections in (A) Santa Rosa Valley, (B), Sonoma Valley, and (C) the southern part of Napa Valley.

## Geology of the Valley Regions

Santa Rosa, Sonoma, and Napa Valleys are divided by ranges composed of Tertiary and Mesozoic rocks that isolate the areas from one another (fig. 3). The valleys are filled with Tertiary marine and continental sediments that may be interfingered with Tertiary volcanic rocks. The well lithologic data may be viewed in 3D space, with the location and drilled depth of wells portrayed as vertical cylinders of varying colors that correspond to separate lithologic classes (fig. 5). When viewed in 3D space, the lithologic classes derived from the drillers' descriptions fall into distinct spatial groupings (fig. 5A). Three fence diagrams were constructed from the 3D lithologic model by intersecting the solid model with multiple vertical sections (figs. 5b and 6). These fence diagrams were located where the highest density of well data occurs.

The hills northwest of the Santa Rosa Plain are dominated by sandy units that represent younger Tertiary marine sedimentary rocks deposited in shelf environments (figs. 5 and 6) (Powell and others, 2004, 2006). These sandy units are expressed as yellow intervals in the well cylinders and on the vertical sections. Beneath the Santa Rosa Valley, marine facies rocks transition to nonmarine deposits across a higher-energy dune and littoral environment (Powell and others, 2004, 2006) represented by gravel or sand and gravel deposits, expressed as brown and orange intervals, respectively, in the well cylinders and on the vertical sections (figs. 5 and 6). Beneath most of the central part of the Santa Rosa Valley and the Petaluma Valley to the southeast, clay-rich units interbedded with coarser material are characteristic of both the Quaternary and Tertiary continental sediments (Allen, 2003; Powell and others, 2004), and are observed in both the well-cylinders and the fence diagram as variable colors of dark blue with thin beds of yellow and orange (figs. 5 and 6). Santa Rosa Valley is flanked on the east primarily by tuff and basalt units that represent Tertiary volcanic rocks ([plate 1](#)), which are expressed as pink and red intervals, respectively, in the well-cylinders and on the vertical sections (figs. 5 and 6).

The north end of Sonoma Valley is characterized by tuff and basalt units ([plate 1](#)) that represent Tertiary volcanic rocks interbedded with clays and gravels of both Quaternary and Tertiary continental sediments (figs. 5 and 6). To the south of the town of Sonoma, the volcanic units dip southward beneath surficial sedimentary cover, and again the subsurface is predominantly clay interbedded with gravel and sand, typical of Tertiary continental sediments (figs. 5 and 6).

The southern part of Napa Valley is dominated by ash, tuff, and basalt units that represent Tertiary volcanic rocks ([plate 1](#)), expressed as pink and red intervals in the well cylinders and on the vertical sections (figs. 4 and 5). In the area southwest of the town of Napa and southeast of Sonoma Valley, the volcanic rocks interfinger with clay-rich units interbedded with coarser material that are characteristic of both the Quaternary and Tertiary continental sediments. Some of the abrupt lithologic transitions visible in the vertical sections result from the complex faulting along the western side of Napa Valley ([plate 1](#)).

## Summary

This data tabulation includes all downhole lithologic information and aquifer pumping test data from 464 of the wells described in the three USGS Water-Supply Papers (Cardwell, 1958; Kunkel and Upson, 1960; Cardwell, 1965) that describe the northern part of the Coast Ranges in California (fig. 1). This report makes available in digital form a large subsurface well dataset so that subsurface lithologic and hydrologic information is available for incorporation within a GIS and use in construction of three-dimensional geologic framework models that can be used to address water-resource issues.

The well data here, although mostly from relatively shallow water wells, provide important subsurface information that displays the disposition and facies transition of lithologic units between the

four principal valleys at the southern end of the study area. Well lithologic data themselves and simple three-dimensional interpolation of those data show distinct spatial patterns ([plate 1](#)) that are linked to subsurface stratigraphy and structure and can be used in more sophisticated three-dimensional analysis of these basins.

## Acknowledgments

We thank Alexandra Anderson (U.S. Geological Survey, retired) for transcribing the well data from the original reports, Daniel Burnham (former U.S. Geological Survey student intern) for spatially referencing the plates and digitizing well locations, and Meghan Patterson (U.S. Geological Survey, student) for digital data compilation.

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## Appendices

**Appendix 1.** Well location data.

**Appendix 2.** Hydrologic data.

**Appendix 3.** Lithologic data.

## Appendix 1. Well Location Data

[Site IDs correspond to locations shown on Plate 1; Well number and area correspond to descriptions in the Water-Supply Paper listed; latitude and longitude geographic coordinates have a horizontal datum of North American Datum 1927; Easting and Northing coordinates are in Universal Transverse Mercator projection zone 10, North American Datum 1927; system of quarter-quarter section designation is explained in the Water-Supply Papers; leaders (-), well number not assigned]

Site ID	Well number	Area	Water-Supply Paper	Latitude	Longitude	Easting	Northing	Township (N)	Range (W)	Section	Quarter-quarter section designation	Well number within quarter-quarter section	Land surface elevation, in meters	Total depth of well, in meters	Geologic units intersected
1	22/13-2A3	Mendocino County; Round Valley	Cardwell (1965)	39.7994	-123.2698	476899	4405313	22	13	2	A	3	432.8	44.5	Sedimentary rocks and pre-Cenozoic rocks
2	22/12-18N1	Mendocino County; Round Valley	Cardwell (1965)	39.7623	-123.2475	478799	4401199	22	12	18	N	1	426.7	137.8	Sedimentary rocks only
3	22/12-19G2	Mendocino County; Round Valley	Cardwell (1965)	39.7533	-123.2382	479592	4400194	22	12	19	G	2	422.1	154.8	Sedimentary rocks only
4	21/15-12K2	Mendocino County; Laytonville Valley	Cardwell (1965)	39.6859	-123.4839	458507	4392802	21	15	12	K	2	495.3	76.2	Sedimentary rocks only
5	21/15-13B1	Mendocino County; Laytonville Valley	Cardwell (1965)	39.6809	-123.4844	458462	4392246	21	15	13	B	1	490.7	160.9	Sedimentary rocks and pre-Cenozoic rocks
6	21/15-14A1	Mendocino County; Laytonville Valley	Cardwell (1965)	39.6791	-123.4959	457474	4392052	21	15	14	A	1	509.0	14.9	Sedimentary rocks only
7	21/14-30M1	Mendocino County; Laytonville Valley	Cardwell (1965)	39.6434	-123.4725	459460	4388081	21	14	30	M	1	514.5	7.0	Sedimentary rocks only
8	21/14-31J1	Mendocino County; Laytonville Valley	Cardwell (1965)	39.6284	-123.4606	460473	4386401	21	14	30	J	1	512.1	123.4	Sedimentary rocks and pre-Cenozoic rocks
9	18/13-18H1	Mendocino County; Little Lake Valley	Cardwell (1965)	39.4144	-123.3371	470978	4362605	18	13	18	H	1	408.4	107.9	Sedimentary rocks only
10	18/13-19B1	Mendocino County; Little Lake Valley	Cardwell (1965)	39.4048	-123.3447	470324	4361544	18	13	19	B	1	414.5	138.4	Sedimentary rocks only
11	18/13-20P2	Mendocino County; Little Lake Valley	Cardwell (1965)	39.3920	-123.3277	471782	4360124	18	13	20	P	2	428.2	21.9	Sedimentary rocks only
12	18/13-31A1	Mendocino County; Little Lake Valley	Cardwell (1965)	39.3767	-123.3383	470864	4358424	18	13	31	A	1	442.0	88.1	Sedimentary rocks only
13	17/11-33D1	Russian River Valley area; Potter, Ukiah, and Sanel Valleys	Cardwell (1965)	39.2914	-123.0908	492167	4348915	17	11	33	D	1	280.4	200.6	Sedimentary rocks and pre-Cenozoic rocks
14	16/12W-34N2	Russian River Valley area; Potter, Ukiah, and Sanel Valleys	Cardwell (1965)	39.1931	-123.1855	483978	4338019	16	12	34	N	2	250.3	64.2	Sedimentary rocks only
15	14/12-5K1	Russian River Valley area; Potter, Ukiah, and Sanel Valleys	Cardwell (1965)	39.1001	-123.2046	482306	4327695	14	12	5	K	1	185.9	28.7	Sedimentary rocks and pre-Cenozoic rocks
16	14/12-26H	Russian River Valley area; Potter, Ukiah, and Sanel Valleys	Cardwell (1965)	39.0689	-123.1461	487364	4324225	14	12	26	H	--	167.6	19.8	Sedimentary rocks only
17	13/11-8H1	Russian River Valley area; Potter, Ukiah, and Sanel Valleys	Cardwell (1965)	39.0014	-123.0855	492599	4316724	13	11	8	H	1	251.5	57.0	Sedimentary rocks only
18	13/11-18D1	Russian River Valley area; Potter, Ukiah, and Sanel Valleys	Cardwell (1965)	38.9907	-123.1189	489707	4315543	13	11	18	D	1	149.4	18.6	Sedimentary rocks only
19	13/11-18M1	Russian River Valley area; Potter, Ukiah, and Sanel Valleys	Cardwell (1965)	38.9846	-123.1177	489805	4314865	13	11	18	M	1	149.4	19.2	Sedimentary rocks only
20	13/11-22G	Russian River Valley area; Potter, Ukiah, and Sanel Valleys	Cardwell (1965)	38.9748	-123.0904	492172	4313779	13	11	22	G	--	236.2	62.5	Sedimentary rocks only
21	13/11-21L2	Mendocino County; Laytonville Valley	Cardwell (1965)	38.9710	-123.0750	493505	4313356	13	11	21	L	2	167.6	67.1	Sedimentary rocks only

**Appendix 1. Well Location Data.—Continued**

[Site IDs correspond to locations shown on Plate 1; Well number and area correspond to descriptions in the Water-Supply Paper listed; latitude and longitude geographic coordinates have a horizontal datum of North American Datum 1927; Easting and Northing coordinates are in Universal Transverse Mercator projection zone 10, North American Datum 1927; system of quarter-quarter section designation is explained in the Water-Supply Papers; leaders (-), well number not assigned]

Site ID	Well number	Area	Water-Supply Paper	Latitude	Longitude	Easting	Northing	Township (N)	Range (W)	Section	Quarter-quarter section designation	Well number within quarter-quarter section	Land surface elevation, in meters	Total depth of well, in meters	Geologic units intersected
22	13/11-19Q1	Russian River Valley area; Potter, Ukiah, and Sanal Valleys	Cardwell (1965)	38.9686	-123.1097	490500	4313087	13	11	19	Q	1	144.8	34.7	Sedimentary rocks only
23	11/10-17R1	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.7968	-122.9908	500795	4294017	11	10	17	R	1	91.4	12.5	Sedimentary rocks and pre-Cenozoic rocks
24	11/10-28L1	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.7708	-122.9798	501757	4291137	11	10	28	L	1	77.7	6.1	Sedimentary rocks only
25	11/10-33A	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.7644	-122.9729	502355	4290429	11	10	33	A	--	77.7	12.2	Sedimentary rocks only
26	10/11-12Q1	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.7222	-123.0257	497762	4285746	10	11	12	Q	1	67.1	16.8	Sedimentary rocks only
27	10/9-26L1	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.6836	-122.8271	515035	4281476	9	8	26	L	1	62.5	74.4	Sedimentary rocks only
28	9/10-2B3	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.6631	-122.9349	505665	4279187	9	10	2	B	3	43.3	86.9	Sedimentary rocks only
29	9/10-2B1	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.6623	-122.9357	505593	4279099	9	10	2	B	1	42.7	32.6	Sedimentary rocks and pre-Cenozoic rocks
30	9/9-4E1	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.6590	-122.8711	511217	4278735	9	9	4	E	1	54.9	35.7	Sedimentary rocks only
31	9/8-7Q1	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.6346	-122.7871	518534	4276044	9	8	7	Q	1	48.8	149.4	Sedimentary rocks only
32	9/9-21R1	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.6090	-122.8575	512405	4273192	9	9	21	R	1	25.9	54.1	Sedimentary rocks only
33	9/9-33E2	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.5850	-122.8702	511305	4270525	9	9	33	E	2	27.4	20.1	Sedimentary rocks only
34	8/9-19K1	Russian River Valley area; Lower Russian River	Cardwell (1965)	38.5218	-122.8973	508953	4263513	8	9	19	K	1	24.4	19.5	Sedimentary rocks and pre-Cenozoic rocks
35	8/10-20M3	Russian River Valley area; Lower Russian River	Cardwell (1965)	38.5211	-122.9969	500267	4263432	8	10	20	M	3	24.4	37.5	Sedimentary rocks only
36	8/10-29D1	Russian River Valley area; Lower Russian River	Cardwell (1965)	38.5155	-122.9963	500327	4262809	8	10	29	D	1	18.3	55.8	Sedimentary rocks and pre-Cenozoic rocks
37	8/10-29H2	Russian River Valley area; Lower Russian River	Cardwell (1965)	38.5096	-122.9842	501380	4262146	8	10	29	H	2	9.1	38.1	Sedimentary rocks and pre-Cenozoic rocks
38	8/10-29N1	Russian River Valley area; Lower Russian River	Cardwell (1965)	38.5052	-122.9981	500165	4261667	8	10	29	N	1	13.7	27.4	Sedimentary rocks only
39	8/9-31A1	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.5007	-122.8940	509246	4261175	8	9	31	A	1	19.8	99.1	Sedimentary rocks only
40	8/9-32E3	Russian River Valley area; Alexander Valley and Healdsburg area	Cardwell (1965)	38.4986	-122.8904	509560	4260941	8	9	32	E	3	18.3	25.3	Sedimentary rocks only

**Appendix 1. Well Location Data.—Continued**

[Site IDs correspond to locations shown on Plate 1; Well number and area correspond to descriptions in the Water-Supply Paper listed; latitude and longitude geographic coordinates have a horizontal datum of North American Datum 1927; Easting and Northing coordinates are in Universal Transverse Mercator projection zone 10, North American Datum 1927; system of quarter-quarter section designation is explained in the Water-Supply Papers; leaders (-), well number not assigned]

Site ID	Well number	Area	Water-Supply Paper	Latitude	Longitude	Easting	Northing	Township (N)	Range (W)	Section	Quarter-quarter section designation	Well number within quarter-quarter section	Land surface elevation, in meters	Total depth of well, in meters	Geologic units intersected
41	7/10-7D1	Russian River Valley area; Lower Russian River	Cardwell (1965)	38.4722	-123.0168	498537	4258003	7	10	7	D	1	7.6	36.6	Sedimentary rocks only
42	7/11-11J1	Russian River Valley area; Lower Russian River	Cardwell (1965)	38.4651	-123.0406	496455	4257219	7	11	11	J	1	12.2	41.5	Sedimentary rocks only
43	7/11-17J1	Russian River Valley area; Lower Russian River	Cardwell (1965)	38.4492	-123.0947	491736	4255458	7	11	17	J	1	4.6	45.1	Sedimentary rocks and pre-Cenozoic rocks
44	8/9-1M1	Santa Rosa Valley	Cardwell (1958)	38.5690	-122.8126	516328	4268755	8	9	1	M	1	56.4	96.0	Sedimentary rocks only
45	8/9-3P1	Santa Rosa Valley	Cardwell (1958)	38.5619	-122.8467	513359	4267969	8	9	3	P	1	25.0	36.0	Sedimentary rocks only
46	8/9-9H1	Santa Rosa Valley	Cardwell (1958)	38.5567	-122.8547	512659	4267390	8	9	9	H	1	14.1	12.2	Sedimentary rocks only
47	8/9-10R1	Santa Rosa Valley	Cardwell (1958)	38.5508	-122.8357	514318	4266733	8	9	10	R	1	50.3	121.9	Hydrology data only; no geologic information
48	8/9-11P1	Santa Rosa Valley	Cardwell (1958)	38.5498	-122.8299	514826	4266626	8	9	11	P	1	40.0	45.7	Sedimentary rocks only
49	8/9-15D1	Santa Rosa Valley	Cardwell (1958)	38.5463	-122.8507	513014	4266237	8	9	15	D	1	20.0	40.8	Sedimentary rocks only
50	8/9-13C1	Santa Rosa Valley	Cardwell (1958)	38.5442	-122.8080	516728	4266010	8	9	13	C	1	32.0	61.6	Sedimentary rocks only
51	8/9-14L1	Santa Rosa Valley	Cardwell (1958)	38.5398	-122.8299	514828	4265516	8	9	14	L	1	29.0	80.8	Sedimentary rocks only
52	8/8-17L1	Santa Rosa Valley	Cardwell (1958)	38.5396	-122.7732	519769	4265506	8	8	17	L	1	56.4	84.7	Sedimentary rocks only
53	8/9-14P1	Santa Rosa Valley	Cardwell (1958)	38.5358	-122.8292	514883	4265076	8	9	14	P	1	29.0	80.5	Sedimentary rocks only
54	8/9-13N1	Santa Rosa Valley	Cardwell (1958)	38.5358	-122.8127	516322	4265070	8	9	13	N	1	27.4	63.4	Sedimentary rocks only
55	8/8-20B2	Santa Rosa Valley	Cardwell (1958)	38.5331	-122.7670	520311	4264783	8	8	20	B	2	56.4	70.4	Sedimentary rocks only
56	8/8-20D1	Santa Rosa Valley	Cardwell (1958)	38.5312	-122.7744	519667	4264576	8	8	20	D	1	44.2	79.2	Hydrology data only; no geologic information
57	8/9-23G1	Santa Rosa Valley	Cardwell (1958)	38.5307	-122.8227	515451	4264511	8	9	23	G	1	22.9	134.1	Sedimentary rocks only
58	8/9-24E1	Santa Rosa Valley	Cardwell (1958)	38.5300	-122.8115	516432	4264427	8	9	24	E	1	24.4	100.6	Hydrology data only; no geologic information
59	8/9-23L1	Santa Rosa Valley	Cardwell (1958)	38.5257	-122.8279	515006	4263950	8	9	23	L	1	22.9	130.8	Sedimentary rocks only
60	8/8-19M1	Santa Rosa Valley	Cardwell (1958)	38.5237	-122.7939	517964	4263740	8	8	19	M	1	32.0	79.2	Sedimentary rocks only
61	8/8-19N1	Santa Rosa Valley	Cardwell (1958)	38.5226	-122.7944	517927	4263617	8	8	19	N	1	32.0	75.9	Sedimentary rocks only
62	8/8-20Q1	Santa Rosa Valley	Cardwell (1958)	38.5193	-122.7670	520315	4263254	8	8	20	Q	1	42.7	95.1	Sedimentary rocks only
63	8/9-26D1	Santa Rosa Valley	Cardwell (1958)	38.5191	-122.8321	514641	4263216	8	9	26	D	1	22.9	141.4	Sedimentary rocks only
64	8/8-29C1	Santa Rosa Valley	Cardwell (1958)	38.5158	-122.7703	520206	4262864	8	8	29	C	1	41.0	20.7	Sedimentary rocks only
65	8/8-29D1	Santa Rosa Valley	Cardwell (1958)	38.5151	-122.7778	519371	4262783	8	8	29	D	1	39.0	17.4	Sedimentary rocks only
66	8/8-30G1	Santa Rosa Valley	Cardwell (1958)	38.5121	-122.7873	518546	4262447	8	8	30	G	1	36.0	42.7	Sedimentary rocks only
67	8/8-30L1	Santa Rosa Valley	Cardwell (1958)	38.5093	-122.7899	518320	4262144	8	8	30	L	1	13.1	141.1	Sedimentary rocks only
68	8/9-27K1	Santa Rosa Valley	Cardwell (1958)	38.5089	-122.8401	513943	4262086	8	9	27	K	1	18.3	101.5	Sedimentary rocks only
69	8/8-30N1	Santa Rosa Valley	Cardwell (1958)	38.5054	-122.7936	518001	4261709	8	8	30	N	1	13.1	138.7	Sedimentary rocks only
70	8/8-30N2	Santa Rosa Valley	Cardwell (1958)	38.5054	-122.7962	517771	4261709	8	8	30	N	2	12.5	182.9	Sedimentary rocks only
71	8/8-31B1	Santa Rosa Valley	Cardwell (1958)	38.5036	-122.7861	518649	4261504	8	8	31	B	1	35.1	64.0	Sedimentary rocks only
72	8/9-33G1	Santa Rosa Valley	Cardwell (1958)	38.4997	-122.8587	512323	4261058	8	9	33	G	1	30.5	109.1	Hydrology data only; no geologic information
73	8/9-36G1	Santa Rosa Valley	Cardwell (1958)	38.4992	-122.8010	517350	4261013	8	9	36	G	1	30.5	195.7	Hydrology data only; no geologic information
74	8/9-36K1	Santa Rosa Valley	Cardwell (1958)	38.4967	-122.8052	516992	4260733	8	9	36	K	1	29.0	403.9	Hydrology data only; no geologic information
75	8/9-36L1	Santa Rosa Valley	Cardwell (1958)	38.4953	-122.8095	516610	4260577	8	9	36	L	1	29.0	172.2	Sedimentary rocks only
76	8/9-33J1	Santa Rosa Valley	Cardwell (1958)	38.4952	-122.8541	512722	4260568	8	9	33	J	1	13.7	99.1	Sedimentary and volcanic rocks
77	8/9-35M1	Santa Rosa Valley	Cardwell (1958)	38.4948	-122.8333	514541	4260517	8	9	35	M	1	19.8	144.8	Hydrology data only; no geologic information
78	8/9-35K1	Santa Rosa Valley	Cardwell (1958)	38.4937	-122.8226	515469	4260400	8	9	35	K	1	24.4	151.8	Sedimentary rocks only
79	8/9-34R1	Santa Rosa Valley	Cardwell (1958)	38.4917	-122.8351	514384	4260180	8	9	34	R	1	19.8	109.7	Sedimentary rocks only
80	8/8-34Q1	Santa Rosa Valley	Cardwell (1958)	38.4912	-122.7307	523488	4260148	8	8	34	Q	1	105.2	86.9	Hydrology data only; no geologic information
81	8/9-36P1	Santa Rosa Valley	Cardwell (1958)	38.4901	-122.8103	516542	4260001	8	9	36	P	1	27.4	320.0	Sedimentary and volcanic rocks

**Appendix 1. Well Location Data. —Continued**

[Site IDs correspond to locations shown on Plate 1; Well number and area correspond to descriptions in the Water-Supply Paper listed; latitude and longitude geographic coordinates have a horizontal datum of North American Datum 1927; Easting and Northing coordinates are in Universal Transverse Mercator projection zone 10, North American Datum 1927; system of quarter-quarter section designation is explained in the Water-Supply Papers; leaders (-), well number not assigned]

Site ID	Well number	Area	Water-Supply Paper	Latitude	Longitude	Easting	Northing	Township (N)	Range (W)	Section	Quarter-quarter section designation	Well number within quarter-quarter section	Land surface elevation, in meters	Total depth of well, in meters	Geologic units intersected
82	7/9-2C1	Santa Rosa Valley	Cardwell (1958)	38.4887	-122.8286	514951	4259851	7	9	2	C	1	21.3	185.9	Hydrology data only; no geologic information
83	8/9-34R2	Santa Rosa Valley	Cardwell (1958)	38.4886	-122.8352	514374	4259838	8	9	34	R	2	19.8	149.7	Sedimentary rocks only
84	7/8-3C1	Santa Rosa Valley	Cardwell (1958)	38.4872	-122.7340	523201	4259700	7	8	3	C	1	53.3	71.6	Sedimentary rocks only
85	7/8-4B3	Santa Rosa Valley	Cardwell (1958)	38.4855	-122.7497	521831	4259509	7	8	4	B	3	45.0	46.3	Sedimentary rocks only
86	7/7-5F1	Santa Rosa Valley	Cardwell (1958)	38.4846	-122.6619	529489	4259430	7	7	5	F	1	107.0	50.0	Sedimentary rocks only
87	7/7-5F2	Santa Rosa Valley	Cardwell (1958)	38.4839	-122.6608	529584	4259356	7	7	5	F	2	99.1	83.8	Sedimentary rocks only
88	7/9-3E1	Santa Rosa Valley	Cardwell (1958)	38.4835	-122.8523	512879	4259265	7	9	3	E	1	45.7	39.6	Sedimentary rocks only
89	7/7-6G1	Santa Rosa Valley	Cardwell (1958)	38.4823	-122.6750	528348	4259167	7	7	6	G	1	89.9	103.0	Sedimentary rocks only
90	7/8-6H2	Santa Rosa Valley	Cardwell (1958)	38.4824	-122.7809	519109	4259152	7	8	6	H	2	41.1	121.0	Sedimentary rocks only
91	7/9-3M1	Santa Rosa Valley	Cardwell (1958)	38.4806	-122.8495	513124	4258939	7	9	3	M	1	30.5	39.9	Sedimentary rocks only
92	7/7-5N1	Santa Rosa Valley	Cardwell (1958)	38.4746	-122.6664	529097	4258323	7	7	5	N	1	82.0	26.8	Sedimentary rocks only
93	7/7-8A1	Santa Rosa Valley	Cardwell (1958)	38.4738	-122.6526	530308	4258241	7	7	8	A	1	96.0	117.3	Hydrology data only; no geologic information
94	7/9-4N1	Santa Rosa Valley	Cardwell (1958)	38.4736	-122.8699	511347	4258167	7	9	4	N	1	85.3	36.6	Sedimentary rocks only
95	7/9-5N1	Santa Rosa Valley	Cardwell (1958)	38.4736	-122.8893	509656	4258160	7	9	5	N	1	51.8	89.0	Sedimentary rocks and pre-Cenozoic rocks
96	7/7-9D3	Santa Rosa Valley	Cardwell (1958)	38.4731	-122.6479	530718	4258156	7	7	9	D	3	121.9	97.2	Sedimentary rocks only
97	7/7-9D2	Santa Rosa Valley	Cardwell (1958)	38.4729	-122.6480	530709	4258133	7	7	9	D	2	114.3	98.5	Sedimentary rocks only
98	7/7-8A2	Santa Rosa Valley	Cardwell (1958)	38.4724	-122.6492	530600	4258082	7	7	8	A	2	109.7	70.1	Sedimentary rocks only
99	7/7-9D1	Santa Rosa Valley	Cardwell (1958)	38.4724	-122.6480	530703	4258082	7	7	9	D	1	115.8	74.7	Sedimentary rocks only
100	7/8-9D1	Santa Rosa Valley	Cardwell (1958)	38.4724	-122.7593	520995	4258048	7	8	9	D	1	39.6	61.0	Hydrology data only; no geologic information
101	7/9-7G1	Santa Rosa Valley	Cardwell (1958)	38.4719	-122.8967	509009	4257973	7	9	7	G	1	18.9	100.9	Hydrology data only; no geologic information
102	7/8-11G1	Santa Rosa Valley	Cardwell (1958)	38.4714	-122.7125	525078	4257956	7	8	11	G	1	88.4	72.2	Hydrology data only; no geologic information
103	7/7-8G2	Santa Rosa Valley	Cardwell (1958)	38.4712	-122.6540	530183	4257952	7	7	8	G	2	88.4	129.5	Hydrology data only; no geologic information
104	7/9-9F1	Santa Rosa Valley	Cardwell (1958)	38.4705	-122.8642	511848	4257817	7	9	9	F	1	20.1	68.9	Sedimentary rocks only
105	7/8-12H1	Santa Rosa Valley	Cardwell (1958)	38.4697	-122.6886	527164	4257773	7	8	12	H	1	140.2	77.7	Hydrology data only; no geologic information
106	7/8-12E2	Santa Rosa Valley	Cardwell (1958)	38.4696	-122.7035	525870	4257753	7	8	12	E	2	74.7	91.4	Hydrology data only; no geologic information
107	7/9-10E1	Santa Rosa Valley	Cardwell (1958)	38.4699	-122.8501	513073	4257752	7	9	10	E	1	61.0	30.5	Sedimentary rocks only
108	7/7-8M2	Santa Rosa Valley	Cardwell (1958)	38.4679	-122.6666	529087	4257573	7	7	8	M	2	76.2	64.3	Hydrology data only; no geologic information
109	7/7-7F2	Santa Rosa Valley	Cardwell (1958)	38.4675	-122.6812	527810	4257531	7	7	7	F	2	74.7	97.5	Sedimentary and volcanic rocks
110	7/9-8J1	Santa Rosa Valley	Cardwell (1958)	38.4676	-122.8730	511076	4257495	7	9	8	J	1	17.6	76.2	Sedimentary rocks only
111	7/8-11K1	Santa Rosa Valley	Cardwell (1958)	38.4666	-122.7121	525114	4257424	7	8	11	K	1	91.4	77.4	Sedimentary rocks only
112	7/8-10L1	Santa Rosa Valley	Cardwell (1958)	38.4659	-122.7349	523124	4257332	7	8	10	L	1	41.1	64.6	Sedimentary rocks only
113	7/9-8K1	Santa Rosa Valley	Cardwell (1958)	38.4661	-122.8773	510704	4257328	7	9	8	K	1	19.0	106.7	Sedimentary rocks only
114	7/8-12K1	Santa Rosa Valley	Cardwell (1958)	38.4654	-122.6917	526898	4257296	7	8	12	K	1	146.3	105.8	Sedimentary rocks only
115	7/8-12Q2	Santa Rosa Valley	Cardwell (1958)	38.4648	-122.6944	526661	4257229	7	8	12	Q	2	131.1	29.0	Sedimentary rocks only
116	7/7-8P2	Santa Rosa Valley	Cardwell (1958)	38.4643	-122.6613	529548	4257183	7	7	8	P	2	86.9	76.2	Volcanic rocks only
117	7/7-8L1	Santa Rosa Valley	Cardwell (1958)	38.4640	-122.6620	529491	4257149	7	7	8	L	1	76.2	84.7	Sedimentary and volcanic rocks
118	7/8-9R1	Santa Rosa Valley	Cardwell (1958)	38.4609	-122.7458	522181	4256776	7	8	9	R	1	36.6	57.0	Sedimentary rocks only
119	7/8-14A1	Santa Rosa Valley	Cardwell (1958)	38.4593	-122.7066	525602	4256610	7	8	14	A	1	53.3	274.6	Sedimentary and volcanic rocks
120	7/7-16A1	Santa Rosa Valley	Cardwell (1958)	38.4590	-122.6352	531831	4256600	7	7	16	A	1	99.1	80.2	Sedimentary rocks only
121	7/7-15C1	Santa Rosa Valley	Cardwell (1958)	38.4589	-122.6251	532710	4256590	7	7	15	C	1	114.3	121.0	Sedimentary rocks only
122	7/7-17A1	Santa Rosa Valley	Cardwell (1958)	38.4589	-122.6532	530254	4256581	7	7	17	A	1	88.4	257.9	Sedimentary and volcanic rocks
123	7/9-15E2	Santa Rosa Valley	Cardwell (1958)	38.4582	-122.8482	513244	4256461	7	9	15	E	2	38.1	67.1	Hydrology data only; no geologic information
124	7/8-14D1	Santa Rosa Valley	Cardwell (1958)	38.4567	-122.7209	524348	4256315	7	8	14	D	1	47.2	91.4	Sedimentary rocks only
125	7/8-14E1	Santa Rosa Valley	Cardwell (1958)	38.4564	-122.7192	524501	4256283	7	8	14	E	1	47.2	232.0	Hydrology data only; no geologic information

**Appendix 1. Well Location Data. —Continued**

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Site ID	Well number	Area	Water-Supply Paper	Latitude	Longitude	Easting	Northing	Township (N)	Range (W)	Section	Quarter-quarter section designation	Well number within quarter-quarter section	Land surface elevation, in meters	Total depth of well, in meters	Geologic units intersected
126	7/9-18J1	Santa Rosa Valley	Cardwell (1958)	38.4552	-122.8936	509288	4256124	7	9	18	J	1	35.1	198.1	Hydrology data only; no geologic information
127	7/8-18M1	Santa Rosa Valley	Cardwell (1958)	38.4550	-122.7929	518075	4256114	7	8	18	M	1	24.4	195.1	Hydrology data only; no geologic information
128	7/9-13M1	Santa Rosa Valley	Cardwell (1958)	38.4537	-122.8116	516436	4255966	7	9	13	M	1	6.9	96.3	Sedimentary rocks only
129	7/8-14M1	Santa Rosa Valley	Cardwell (1958)	38.4533	-122.7182	524593	4255945	7	8	14	M	1	47.2	69.4	Hydrology data only; no geologic information
130	7/8-13J1B	Santa Rosa Valley	Cardwell (1958)	38.4532	-122.6871	527303	4255939	7	8	13	J	1	6.1	77.1	Hydrology data only; no geologic information
131	7/8-18K1	Santa Rosa Valley	Cardwell (1958)	38.4533	-122.7858	518691	4255923	7	8	18	K	1	25.9	128.0	Sedimentary rocks only
132	7/9-18K1	Santa Rosa Valley	Cardwell (1958)	38.4534	-122.8939	509260	4255919	7	9	18	K	1	35.1	81.1	Hydrology data only; no geologic information
133	7/9-16L1	Santa Rosa Valley	Cardwell (1958)	38.4528	-122.8621	512032	4255858	7	9	16	L	1	67.1	77.7	Hydrology data only; no geologic information
134	7/8-13J2	Santa Rosa Valley	Cardwell (1958)	38.4522	-122.6886	527174	4255823	7	8	13	J	2	64.0	64.0	Hydrology data only; no geologic information
135	7/8-18Q1	Santa Rosa Valley	Cardwell (1958)	38.4511	-122.7828	518950	4255685	7	8	18	Q	1	24.4	268.5	Sedimentary rocks only
136	7/8-13K1	Santa Rosa Valley	Cardwell (1958)	38.4508	-122.6930	526789	4255673	7	8	13	K	1	61.0	161.2	Sedimentary rocks only
137	7/9-15Q1	Santa Rosa Valley	Cardwell (1958)	38.4511	-122.8425	513748	4255672	7	9	15	Q	1	22.9	61.0	Hydrology data only; no geologic information
138	7/9-14K1	Santa Rosa Valley	Cardwell (1958)	38.4511	-122.8222	515515	4255672	7	9	14	K	1	24.4	193.9	Sedimentary rocks only
139	7/7-18L1	Santa Rosa Valley	Cardwell (1958)	38.4494	-122.6775	528144	4255525	7	7	18	L	1	60.0	49.1	Sedimentary and volcanic rocks
140	7/9-16Q1A	Santa Rosa Valley	Cardwell (1958)	38.4495	-122.8594	512272	4255495	7	9	16	Q	1	68.6	81.7	Hydrology data only; no geologic information
141	7/9-16Q1B	Santa Rosa Valley	Cardwell (1958)	38.4495	-122.8594	512272	4255495	7	9	16	Q	1	68.6	97.8	Hydrology data only; no geologic information
142	7/9-13R1	Santa Rosa Valley	Cardwell (1958)	38.4493	-122.7984	517589	4255476	7	8	13	R	1	21.3	114.3	Sedimentary rocks only
143	7/8-17N1	Santa Rosa Valley	Cardwell (1958)	38.4481	-122.7757	519574	4255348	7	8	17	N	1	25.9	165.8	Sedimentary rocks only
144	7/9-21B1	Santa Rosa Valley	Cardwell (1958)	38.4477	-122.8598	512238	4255288	7	9	21	B	1	73.2	167.6	Hydrology data only; no geologic information
145	7/7-18R2	Santa Rosa Valley	Cardwell (1958)	38.4451	-122.6706	528747	4255049	7	7	18	R	2	64.0	62.8	Sedimentary and volcanic rocks
146	7/8-24A2	Santa Rosa Valley	Cardwell (1958)	38.4452	-122.6869	527320	4255048	7	8	24	A	2	59.4	283.5	Hydrology data only; no geologic information
147	7/7-18N1	Santa Rosa Valley	Cardwell (1958)	38.4451	-122.6825	527708	4255045	7	7	18	N	1	63.0	42.7	Sedimentary rocks only
148	7/8-21C1	Santa Rosa Valley	Cardwell (1958)	38.4449	-122.7515	521688	4255005	7	8	21	C	1	33.5	94.5	Hydrology data only; no geologic information
149	7/8-20C1	Santa Rosa Valley	Cardwell (1958)	38.4450	-122.7725	519857	4255005	7	8	19	P	2	27.4	190.5	Sedimentary rocks only
150	7/9-21C1	Santa Rosa Valley	Cardwell (1958)	38.4450	-122.8641	511858	4254991	7	9	21	C	1	68.6	99.1	Sedimentary rocks only
151	7/8-24A3	Santa Rosa Valley	Cardwell (1958)	38.4443	-122.6869	527325	4254949	7	8	24	A	3	59.4	91.4	Hydrology data only; no geologic information
152	7/9-23F1	Santa Rosa Valley	Cardwell (1958)	38.4446	-122.8265	515145	4254948	7	9	23	F	1	4.9	185.9	Sedimentary rocks only
153	7/8-20D1	Santa Rosa Valley	Cardwell (1958)	38.4441	-122.7755	519594	4254908	7	8	20	D	1	27.4	147.5	Sedimentary rocks only
154	7/8-24A5	Santa Rosa Valley	Cardwell (1958)	38.4435	-122.6870	527313	4254858	7	8	24	A	5	57.9	88.7	Hydrology data only; no geologic information
155	7/8-24A6	Santa Rosa Valley	Cardwell (1958)	38.4433	-122.6868	527332	4254844	7	8	24	A	6	57.9	365.8	Hydrology data only; no geologic information
156	7/7-14A1	Santa Rosa Valley	Cardwell (1958)	38.4430	-122.5779	536833	4254843	7	7	24	A	1	172.2	189.6	Volcanic rocks only
157	7/7-23A1	Santa Rosa Valley	Cardwell (1958)	38.4428	-122.5939	535439	4254820	7	7	23	A	1	144.8	111.3	Sedimentary and volcanic rocks
158	7/8-24A4	Santa Rosa Valley	Cardwell (1958)	38.4428	-122.6889	527148	4254785	7	8	24	A	1	59.4	304.8	Sedimentary and volcanic rocks
159	7/7-24A1	Santa Rosa Valley	Cardwell (1958)	38.4421	-122.5785	536784	4254750	7	7	24	A	1	172.2	189.6	Sedimentary and volcanic rocks
160	7/9-21G2	Santa Rosa Valley	Cardwell (1958)	38.4426	-122.8594	512267	4254724	7	9	21	G	2	62.5	73.2	Hydrology data only; no geologic information
161	7/7-23A2	Santa Rosa Valley	Cardwell (1958)	38.4416	-122.5949	535353	4254682	7	7	23	A	2	137.2	102.7	Sedimentary rocks only
162	7/9-22F1	Santa Rosa Valley	Cardwell (1958)	38.4420	-122.8440	513617	4254667	7	9	22	F	1	38.1	175.3	Sedimentary rocks only
163	7/9-22F2	Santa Rosa Valley	Cardwell (1958)	38.4418	-122.8468	513367	4254642	7	9	22	F	2	45.7	115.8	Hydrology data only; no geologic information
164	7/9-21F1	Santa Rosa Valley	Cardwell (1958)	38.4416	-122.8644	511832	4254615	7	9	21	F	1	61.0	97.5	Hydrology data only; no geologic information
165	7/9-21G3	Santa Rosa Valley	Cardwell (1958)	38.4414	-122.8611	512125	4254598	7	9	21	G	3	65.5	124.4	Sedimentary rocks only
166	7/7-23G1	Santa Rosa Valley	Cardwell (1958)	38.4404	-122.5986	535033	4254549	7	7	23	G	1	131.1	356.6	Sedimentary and volcanic rocks
167	7/9-21G1	Santa Rosa Valley	Cardwell (1958)	38.4405	-122.8590	512308	4254488	7	9	21	G	1	73.2	161.5	Sedimentary rocks only
168	7/9-21J1	Santa Rosa Valley	Cardwell (1958)	38.4401	-122.8574	512444	4254445	7	9	21	J	1	70.1	62.5	Sedimentary rocks only
169	7/9-23K1	Santa Rosa Valley	Cardwell (1958)	38.4398	-122.8230	515449	4254424	7	9	23	K	1	25.9	61.0	Hydrology data only; no geologic information

**Appendix 1. Well Location Data. —Continued**

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Site ID	Well number	Area	Water-Supply Paper	Latitude	Longitude	Easting	Northing	Township (N)	Range (W)	Section	Quarter-quarter section designation	Well number within quarter-quarter section	Land surface elevation, in meters	Total depth of well, in meters	Geologic units intersected
170	7/9-24L2	Santa Rosa Valley	Cardwell (1958)	38.4396	-122.8085	516715	4254399	7	9	24	L	2	29.0	100.6	Hydrology data only; no geologic information
171	7/8-23L1	Santa Rosa Valley	Cardwell (1958)	38.4374	-122.7172	524680	4254182	7	8	23	L	1	47.2	91.4	Sedimentary rocks only
172	7/8-24K1	Santa Rosa Valley	Cardwell (1958)	38.4372	-122.6954	526582	4254167	7	8	24	K	1	54.9	72.5	Sedimentary rocks only
173	7/8-23M3	Santa Rosa Valley	Cardwell (1958)	38.4368	-122.7184	524581	4254113	7	8	23	M	3	47.2	91.4	Hydrology data only; no geologic information
174	7/8-22K1	Santa Rosa Valley	Cardwell (1958)	38.4364	-122.7318	523408	4254067	7	8	22	K	1	41.1	86.9	Hydrology data only; no geologic information
175	7/8-23M4	Santa Rosa Valley	Cardwell (1958)	38.4362	-122.7228	524191	4254049	7	8	23	M	4	45.7	389.8	Sedimentary and volcanic rocks
176	7/8-19P1	Santa Rosa Valley	Cardwell (1958)	38.4361	-122.7880	518506	4254018	7	8	19	P	1	25.9	74.7	Sedimentary rocks only
177	7/8-20K1	Santa Rosa Valley	Cardwell (1958)	38.4359	-122.7659	520429	4254000	7	8	20	K	1	29.9	190.8	Sedimentary rocks only
178	7/9-24J1	Santa Rosa Valley	Cardwell (1958)	38.4351	-122.7988	517557	4253904	7	9	24	J	1	28.0	632.8	Sedimentary rocks only
179	7/8-22R2	Santa Rosa Valley	Cardwell (1958)	38.4348	-122.7257	523942	4253882	7	8	22	R	2	44.2	62.5	Hydrology data only; no geologic information
180	7/8-23M1	Santa Rosa Valley	Cardwell (1958)	38.4347	-122.7194	524492	4253878	7	8	23	M	1	47.2	304.8	Sedimentary rocks only
181	7/8-22Q1	Santa Rosa Valley	Cardwell (1958)	38.4343	-122.7294	523616	4253835	7	8	22	Q	1	42.7	109.7	Hydrology data only; no geologic information
182	7/9-30A1	Santa Rosa Valley	Cardwell (1958)	38.4338	-122.8910	509517	4253741	7	9	30	A	1	41.1	79.2	Hydrology data only; no geologic information
183	7/8-23P1	Santa Rosa Valley	Cardwell (1958)	38.4334	-122.7159	524801	4253736	7	8	23	P	1	45.7	81.1	Sedimentary rocks only
184	7/6-19R1	Santa Rosa Valley	Cardwell (1958)	38.4325	-122.5599	538410	4253687	7	6	19	R	1	146.1	91.4	Sedimentary and volcanic rocks
185	7/6-19N1	Santa Rosa Valley	Cardwell (1958)	38.4305	-122.5737	537208	4253459	7	6	19	N	1	142.1	45.4	Sedimentary rocks only
186	7/9-25A1A	Santa Rosa Valley	Cardwell (1958)	38.4308	-122.8002	517441	4253428	7	9	25	A	1	24.4	26.2	Sedimentary rocks only
187	7/9-25A1B	Santa Rosa Valley	Cardwell (1958)	38.4308	-122.8002	517441	4253428	7	9	25	A	1	24.4	78.0	Sedimentary rocks only
188	7/9-30G2	Santa Rosa Valley	Cardwell (1958)	38.4293	-122.8964	509040	4253246	7	9	30	G	2	61.0	61.0	Hydrology data only; no geologic information
189	7/7-29D1	Santa Rosa Valley	Cardwell (1958)	38.4288	-122.6662	529139	4253241	7	7	29	D	1	73.2	179.2	Sedimentary and volcanic rocks
190	7/9-27E2	Santa Rosa Valley	Cardwell (1958)	38.4289	-122.8487	513208	4253213	7	9	27	E	2	50.3	112.8	Sedimentary rocks only
191	7/9-27F1	Santa Rosa Valley	Cardwell (1958)	38.4276	-122.8472	513339	4253068	7	9	27	F	1	45.7	61.0	Hydrology data only; no geologic information
192	7/7-30C1	Santa Rosa Valley	Cardwell (1958)	38.4272	-122.6778	528126	4253063	7	7	30	C	1	77.7	136.6	Sedimentary and volcanic rocks
193	7/9-28G1	Santa Rosa Valley	Cardwell (1958)	38.4275	-122.8596	512260	4253046	7	9	28	G	1	36.6	79.2	Sedimentary rocks only
194	7/9-28G2	Santa Rosa Valley	Cardwell (1958)	38.4272	-122.8593	512284	4253022	7	9	28	G	2	35.1	73.2	Sedimentary rocks only
195	7/9-27E1	Santa Rosa Valley	Cardwell (1958)	38.4265	-122.8498	513115	4252936	7	9	27	E	1	44.2	79.2	Sedimentary rocks only
196	7/9-30J1	Santa Rosa Valley	Cardwell (1958)	38.4264	-122.8903	509573	4252922	7	9	30	J	1	86.9	61.0	Sedimentary rocks only
197	7/9-26M1	Santa Rosa Valley	Cardwell (1958)	38.4260	-122.8332	514560	4252887	7	9	26	M	1	24.4	62.8	Hydrology data only; no geologic information
198	7/8-28F1	Santa Rosa Valley	Cardwell (1958)	38.4255	-122.7547	521410	4252845	7	8	28	F	1	30.5	20.1	Sedimentary rocks only
199	7/9-28L1	Santa Rosa Valley	Cardwell (1958)	38.4243	-122.8642	511859	4252692	7	9	28	L	1	33.5	165.2	Sedimentary rocks only
200	7/9-29J1	Santa Rosa Valley	Cardwell (1958)	38.4239	-122.8724	511135	4252646	7	9	29	J	1	36.6	121.9	Hydrology data only; no geologic information
201	7/8-25L1	Santa Rosa Valley	Cardwell (1958)	38.4229	-122.6987	526298	4252579	7	8	25	L	1	53.3	227.1	Hydrology data only; no geologic information
202	7/8-29R1	Santa Rosa Valley	Cardwell (1958)	38.4213	-122.7604	520913	4252382	7	8	29	R	1	28.3	207.9	Sedimentary rocks only
203	7/8-29R2	Santa Rosa Valley	Cardwell (1958)	38.4211	-122.7602	520935	4252360	7	8	29	R	2	28.7	244.1	Hydrology data only; no geologic information
204	7/9-29J2	Santa Rosa Valley	Cardwell (1958)	38.4210	-122.8737	511028	4252328	7	9	29	J	1	36.6	200.3	Sedimentary rocks only
205	7/9-28P1	Santa Rosa Valley	Cardwell (1958)	38.4194	-122.8663	511675	4252146	7	9	28	P	1	35.1	178.3	Hydrology data only; no geologic information
206	7/8-29J1	Santa Rosa Valley	Cardwell (1958)	38.4190	-122.7617	520801	4252126	7	8	29	J	1	28.7	213.4	Sedimentary rocks only
207	7/8-25R1	Santa Rosa Valley	Cardwell (1958)	38.4183	-122.6894	527119	4252069	7	8	25	R	1	71.6	97.5	Hydrology data only; no geologic information
208	7/9-33D2	Santa Rosa Valley	Cardwell (1958)	38.4182	-122.8675	511568	4252023	7	9	33	D	2	47.2	91.4	Hydrology data only; no geologic information
209	7/9-33A1	Santa Rosa Valley	Cardwell (1958)	38.4180	-122.8534	512795	4252000	7	9	33	A	1	68.6	74.7	Hydrology data only; no geologic information
210	7/9-31A1	Santa Rosa Valley	Cardwell (1958)	38.4161	-122.8897	509634	4251779	7	9	31	A	1	125.0	73.2	Hydrology data only; no geologic information
211	7/8-36D2	Santa Rosa Valley	Cardwell (1958)	38.4156	-122.7045	525797	4251760	7	8	36	D	2	50.3	76.8	Sedimentary and volcanic rocks
212	7/8-30P1	Santa Rosa Valley	Cardwell (1958)	38.4153	-122.7899	518343	4251714	7	8	30	P	1	25.9	62.5	Sedimentary rocks only
213	7/8-31C1	Santa Rosa Valley	Cardwell (1958)	38.4146	-122.7911	518238	4251627	7	8	31	C	1	26.8	97.5	Sedimentary rocks only

**Appendix 1. Well Location Data. —Continued**

[Site IDs correspond to locations shown on Plate 1; Well number and area correspond to descriptions in the Water-Supply Paper listed; latitude and longitude geographic coordinates have a horizontal datum of North American Datum 1927; Easting and Northing coordinates are in Universal Transverse Mercator projection zone 10, North American Datum 1927; system of quarter-quarter section designation is explained in the Water-Supply Papers; leaders (-), well number not assigned]

Site ID	Well number	Area	Water-Supply Paper	Latitude	Longitude	Easting	Northing	Township (N)	Range (W)	Section	Quarter-quarter section designation	Well number within quarter-quarter section	Land surface elevation, in meters	Total depth of well, in meters	Geologic units intersected
214	7/8-35H1	Santa Rosa Valley	Cardwell (1958)	38.4143	-122.7050	525751	4251619	7	8	35	H	1	45.7	82.3	Hydrology data only; no geologic information
215	7/9-34G1	Santa Rosa Valley	Cardwell (1958)	38.4145	-122.8401	513963	4251613	7	9	34	G	1	59.4	109.1	Sedimentary rocks only
216	7/9-32F2	Santa Rosa Valley	Cardwell (1958)	38.4141	-122.8799	510482	4251559	7	9	32	F	2	120.4	111.3	Hydrology data only; no geologic information
217	7/9-33F1	Santa Rosa Valley	Cardwell (1958)	38.4128	-122.8658	511720	4251417	7	9	33	F	1	50.3	61.0	Sedimentary rocks only
218	7/9-35E1	Santa Rosa Valley	Cardwell (1958)	38.4127	-122.8311	514746	4251417	7	9	35	E	1	45.7	77.1	Hydrology data only; no geologic information
219	7/9-32E1	Santa Rosa Valley	Cardwell (1958)	38.4125	-122.8878	509795	4251386	7	9	32	E	1	147.8	61.0	Hydrology data only; no geologic information
220	7/9-36H1	Santa Rosa Valley	Cardwell (1958)	38.4116	-122.8013	517350	4251296	7	9	36	H	1	25.9	173.1	Sedimentary rocks only
221	7/6-32F1	Santa Rosa Valley	Cardwell (1958)	38.4106	-122.5515	539160	4251259	7	6	32	F	1	121.0	57.9	Sedimentary rocks only
222	7/9-34L1	Santa Rosa Valley	Cardwell (1958)	38.4110	-122.8444	513582	4251227	7	9	34	L	1	57.9	96.0	Sedimentary rocks only
223	7/9-36F1	Santa Rosa Valley	Cardwell (1958)	38.4099	-122.8073	516823	4251101	7	9	36	F	1	25.9	82.3	Sedimentary rocks only
224	7/9-31J1	Santa Rosa Valley	Cardwell (1958)	38.4098	-122.8920	509428	4251083	7	9	31	J	1	141.7	107.3	Sedimentary rocks only
225	7/9-34J1	Santa Rosa Valley	Cardwell (1958)	38.4096	-122.8358	514335	4251070	7	9	34	J	1	57.9	70.1	Hydrology data only; no geologic information
226	7/7-32G1	Santa Rosa Valley	Cardwell (1958)	38.4092	-122.6545	530162	4251064	7	7	32	G	1	99.1	122.8	Sedimentary and volcanic rocks
227	7/9-34J2	Santa Rosa Valley	Cardwell (1958)	38.4088	-122.8349	514415	4250985	7	9	34	J	2	53.3	106.7	Hydrology data only; no geologic information
228	7/8-33M1	Santa Rosa Valley	Cardwell (1958)	38.4075	-122.7553	521363	4250846	7	8	33	M	1	8.5	137.8	Sedimentary rocks only
229	7/9-31Q1	Santa Rosa Valley	Cardwell (1958)	38.4075	-122.8935	509303	4250829	7	9	31	Q	1	146.3	71.6	Sedimentary rocks only
230	7/9-36M1	Santa Rosa Valley	Cardwell (1958)	38.4070	-122.8121	516406	4250786	7	9	36	M	1	20.0	26.8	Sedimentary rocks only
231	7/9-31Q3	Santa Rosa Valley	Cardwell (1958)	38.4061	-122.8942	509239	4250673	7	9	31	Q	3	143.3	76.2	Hydrology data only; no geologic information
232	7/9-35R1	Santa Rosa Valley	Cardwell (1958)	38.4039	-122.8200	515717	4250434	7	9	35	R	1	20.0	27.4	Sedimentary rocks only
233	6/9-3A1	Santa Rosa Valley	Cardwell (1958)	38.3986	-122.8381	514137	4249847	6	9	3	A	1	70.1	79.2	Sedimentary rocks only
234	6/9-2C1	Santa Rosa Valley	Cardwell (1958)	38.3974	-122.8273	515080	4249721	6	9	2	C	1	36.6	182.9	Sedimentary rocks only
235	6/8-5E1	Santa Rosa Valley	Cardwell (1958)	38.3945	-122.7761	519551	4249405	6	8	5	E	1	25.9	194.5	Sedimentary rocks only
236	6/6-4J1	Santa Rosa Valley	Cardwell (1958)	38.3929	-122.5224	541711	4249310	6	6	4	J	1	123.8	57.9	Volcanic rocks only
237	6/7-3Q1	Santa Rosa Valley	Cardwell (1958)	38.3872	-122.6176	533400	4248644	6	7	3	Q	1	169.2	127.1	Sedimentary and volcanic rocks
238	6/8-7D1	Santa Rosa Valley	Cardwell (1958)	38.3860	-122.7961	517806	4248462	6	8	7	D	1	21.3	109.7	Sedimentary rocks only
239	6/8-12J1	Santa Rosa Valley	Cardwell (1958)	38.3791	-122.6894	527130	4247716	6	8	12	J	1	39.6	68.0	Sedimentary rocks only
240	6/6-8N1	Santa Rosa Valley	Cardwell (1958)	38.3752	-122.5522	539115	4247329	6	6	8	N	1	98.5	149.4	Sedimentary and volcanic rocks
241	6/6-17A1	Santa Rosa Valley	Cardwell (1958)	38.3720	-122.5411	540090	4246984	6	6	17	A	1	110.6	45.7	Sedimentary rocks only
242	6/8-17K1	Santa Rosa Valley	Cardwell (1958)	38.3621	-122.7696	520131	4245814	6	8	17	K	1	42.7	64.0	Sedimentary rocks only
243	6/8-16R1A	Santa Rosa Valley	Cardwell (1958)	38.3604	-122.7436	522404	4245623	6	8	16	R	1	27.4	367.0	Sedimentary and volcanic rocks
244	6/9-22A1	Santa Rosa Valley	Cardwell (1958)	38.3553	-122.8349	514422	4245045	6	9	22	A	1	36.6	109.7	Sedimentary rocks only
245	6/7-19D1	Santa Rosa Valley	Cardwell (1958)	38.3550	-122.6833	527669	4245043	6	7	19	D	1	35.0	32.9	Sedimentary rocks only
246	6/8-23C1	Santa Rosa Valley	Cardwell (1958)	38.3546	-122.7144	524952	4244996	6	8	23	C	1	29.0	133.5	Sedimentary rocks only
247	6/8-22N1	Santa Rosa Valley	Cardwell (1958)	38.3448	-122.7389	522815	4243898	6	8	22	N	1	36.6	61.0	Sedimentary rocks only
248	6/7-29P1	Santa Rosa Valley	Cardwell (1958)	38.3290	-122.6595	529759	4242171	6	7	29	P	1	62.0	56.4	Sedimentary and volcanic rocks
249	6/8-35A2	Santa Rosa Valley	Cardwell (1958)	38.3276	-122.7067	525637	4242002	6	8	35	A	2	33.5	201.2	Sedimentary rocks only
250	6/8-36A1	Santa Rosa Valley	Cardwell (1958)	38.3253	-122.6885	527231	4241744	6	8	36	A	1	35.1	211.8	Sedimentary rocks only
251	6/7-31H1	Santa Rosa Valley	Cardwell (1958)	38.3249	-122.6668	529124	4241707	6	7	31	H	1	48.8	90.8	Sedimentary rocks only
252	6/7-31G1	Santa Rosa Valley	Cardwell (1958)	38.3235	-122.6761	528312	4241549	6	7	31	G	1	41.1	154.8	Sedimentary and volcanic rocks
253	6/8-33E1	Santa Rosa Valley	Cardwell (1958)	38.3210	-122.7556	521365	4241252	6	8	33	E	1	59.4	65.5	Sedimentary rocks only
254	6/7-31L1	Santa Rosa Valley	Cardwell (1958)	38.3195	-122.6763	528294	4241104	6	7	31	L	1	39.0	24.1	Sedimentary rocks only
255	6/7-32M1	Santa Rosa Valley	Cardwell (1958)	38.3193	-122.6652	529264	4241094	6	7	32	M	1	56.4	354.5	Sedimentary and volcanic rocks
256	6/7-31J1	Santa Rosa Valley	Cardwell (1958)	38.3175	-122.6713	528732	4240891	6	7	31	J	1	41.1	85.3	Sedimentary rocks only
257	5/7-6E1	Petaluma Valley	Cardwell (1958)	38.3108	-122.6823	527774	4240140	5	7	6	E	1	33.4	35.1	Sedimentary rocks only

**Appendix 1. Well Location Data.—Continued**

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Site ID	Well number	Area	Water-Supply Paper	Latitude	Longitude	Easting	Northing	Township (N)	Range (W)	Section	Quarter-quarter section designation	Well number within quarter-quarter section	Land surface elevation, in meters	Total depth of well, in meters	Geologic units intersected
258	5/8-1H1	Petaluma Valley	Cardwell (1958)	38.3101	-122.6899	527115	4240058	5	8	1	H	1	37.0	70.7	Sedimentary rocks only
259	5/7-5K1	Petaluma Valley	Cardwell (1958)	38.3072	-122.6532	530323	4239747	5	7	5	K	1	12.1	103.3	Sedimentary rocks only
260	5/8-1J1	Petaluma Valley	Cardwell (1958)	38.3071	-122.6891	527186	4239729	5	8	1	J	1	38.0	88.4	Sedimentary rocks only
261	5/8-1L1	Petaluma Valley	Cardwell (1958)	38.3059	-122.6967	526520	4239589	5	8	1	L	1	57.2	77.1	Sedimentary rocks only
262	5/8-13B1	Petaluma Valley	Cardwell (1958)	38.2821	-122.6901	527101	4236949	5	8	13	B	1	3.7	52.4	Sedimentary rocks only
263	5/7-15K1	Petaluma Valley	Cardwell (1958)	38.2741	-122.6196	533273	4236094	5	7	15	K	1	14.7	32.3	Sedimentary rocks only
264	5/7-20C1	Petaluma Valley	Cardwell (1958)	38.2679	-122.6609	529661	4235384	5	7	20	C	1	2.7	209.7	Sedimentary rocks only
265	5/7-19N1	Petaluma Valley	Cardwell (1958)	38.2563	-122.6817	527847	4234091	5	7	19	N	1	4.0	54.9	Sedimentary rocks only
266	5/7-25A1	Petaluma Valley	Cardwell (1958)	38.2543	-122.5735	537314	4233905	5	7	25	A	1	11.0	80.8	Sedimentary rocks only
267	5/7-25C1	Petaluma Valley	Cardwell (1958)	38.2540	-122.5826	536517	4233868	5	7	25	C	1	10.3	71.6	Sedimentary rocks only
268	5/7-28A3	Petaluma Valley	Cardwell (1958)	38.2540	-122.6284	532511	4233851	5	7	28	A	3	10.7	85.3	Sedimentary rocks only
269	5/7-28H5	Petaluma Valley	Cardwell (1958)	38.2525	-122.6289	532470	4233694	5	7	28	H	5	3.2	142.6	Sedimentary rocks only
270	5/7-28H1	Petaluma Valley	Cardwell (1958)	38.2512	-122.6286	532498	4233548	5	7	28	H	1	4.6	147.2	Sedimentary rocks only
271	5/7-26R1	Petaluma Valley	Cardwell (1958)	38.2442	-122.5935	535573	4232787	5	7	26	R	1	4.0	254.5	Sedimentary rocks and pre-Cenozoic rocks
272	5/7-35H1	Petaluma Valley	Cardwell (1958)	38.2354	-122.5948	535460	4231808	5	7	35	H	1	3.0	165.2	Sedimentary rocks only
273	5/7-33M1	Petaluma Valley	Cardwell (1958)	38.2343	-122.6438	531178	4231666	5	7	33	M	1	9.1	40.2	Sedimentary rocks only
274	5/7-33Q1	Petaluma Valley	Cardwell (1958)	38.2301	-122.6329	532134	4231199	5	7	33	Q	1	1.7	62.5	Sedimentary rocks and pre-Cenozoic rocks
275	5/7-32R1	Petaluma Valley	Cardwell (1958)	38.2300	-122.6486	530760	4231183	5	7	32	R	1	6.1	66.1	Sedimentary rocks and pre-Cenozoic rocks
276	4/6-27L1	Petaluma Valley	Cardwell (1958)	38.1609	-122.5132	542648	4223570	4	6	27	L	1	1.5	152.4	Sedimentary rocks only
277	6/6-10F1	Santa Rosa Valley	Cardwell (1958)	38.3805	-122.5137	542472	4247939	6	6	10	F	1	102.1	106.7	Sedimentary and volcanic rocks
278	6/6-16J2	Sonoma Valley	Kunkel and Upson (1960)	38.3653	-122.5236	541623	4246246	6	6	16	J	2	79.2	85.3	Sedimentary rocks only
279	6/6-22R3	Sonoma Valley	Kunkel and Upson (1960)	38.3463	-122.5032	543412	4244152	6	6	22	R	3	57.9	127.4	Sedimentary and volcanic rocks
280	6/6-26E1	Sonoma Valley	Kunkel and Upson (1960)	38.3384	-122.4995	543740	4243271	6	6	26	E	1	54.9	92.7	Sedimentary and volcanic rocks
281	6/6-34C1	Sonoma Valley	Kunkel and Upson (1960)	38.3284	-122.5099	542835	4242162	6	6	34	C	1	61.0	152.4	Sedimentary rocks only
282	5/5-8B1	Sonoma Valley	Kunkel and Upson (1960)	38.2989	-122.4330	549579	4238920	5	5	8	B	1	44.2	24.4	Sedimentary rocks only
283	5/5-8A1	Sonoma Valley	Kunkel and Upson (1960)	38.2986	-122.4308	549771	4238894	5	5	8	A	1	53.2	53.3	Sedimentary and volcanic rocks
284	5/5-7A1	Sonoma Valley	Kunkel and Upson (1960)	38.2979	-122.4477	548297	4238811	5	5	7	A	1	39.6	175.3	Sedimentary and volcanic rocks
285	5/5-8E1	Sonoma Valley	Kunkel and Upson (1960)	38.2961	-122.4459	548458	4238603	5	5	8	E	1	34.1	71.6	Sedimentary and volcanic rocks
286	5/5-9M1	Sonoma Valley	Kunkel and Upson (1960)	38.2926	-122.4253	550260	4238231	5	5	9	M	1	44.8	65.5	Sedimentary and volcanic rocks
287	5/6-10K1	Sonoma Valley	Kunkel and Upson (1960)	38.2918	-122.5060	543203	4238100	5	6	10	K	1	61.0	72.8	Sedimentary rocks only
288	5/5-9N2	Sonoma Valley	Kunkel and Upson (1960)	38.2863	-122.4253	550263	4237534	5	5	9	N	2	30.8	86.9	Sedimentary rocks only
289	5/5-8P1	Sonoma Valley	Kunkel and Upson (1960)	38.2862	-122.4405	548934	4237511	5	5	8	P	1	27.7	128.3	Sedimentary and volcanic rocks
290	5/5-17B1	Sonoma Valley	Kunkel and Upson (1960)	38.2853	-122.4334	549554	4237414	5	5	17	B	1	28.0	219.5	Sedimentary rocks only
291	5/5-17C4	Sonoma Valley	Kunkel and Upson (1960)	38.2852	-122.4380	549150	4237397	5	5	17	C	4	28.3	80.8	Sedimentary rocks only
292	5/6-14B2	Sonoma Valley	Kunkel and Upson (1960)	38.2840	-122.4889	544703	4237241	5	6	14	B	2	29.0	61.0	Sedimentary rocks only
293	5/5-16E1	Sonoma Valley	Kunkel and Upson (1960)	38.2812	-122.4255	550244	4236960	5	5	16	E	1	24.1	119.8	Sedimentary rocks only
294	5/6-13F1	Sonoma Valley	Kunkel and Upson (1960)	38.2794	-122.4752	545904	4236744	5	6	13	F	1	18.9	33.5	Sedimentary rocks only
295	5/6-13F2	Sonoma Valley	Kunkel and Upson (1960)	38.2787	-122.4768	545766	4236666	5	6	13	F	2	20.1	32.0	Sedimentary rocks only
296	5/5-17J1	Sonoma Valley	Kunkel and Upson (1960)	38.2778	-122.4290	549948	4236582	5	5	17	J	1	21.3	86.9	Sedimentary rocks only
297	5/5-18K1	Sonoma Valley	Kunkel and Upson (1960)	38.2751	-122.4554	547640	4236274	5	5	18	K	1	14.9	39.0	Sedimentary rocks only
298	5/5-17N1	Sonoma Valley	Kunkel and Upson (1960)	38.2723	-122.4427	548750	4235969	5	5	17	N	1	13.7	144.8	Sedimentary and volcanic rocks
299	5/5-17R2	Sonoma Valley	Kunkel and Upson (1960)	38.2721	-122.4288	549968	4235955	5	5	17	R	2	17.7	109.4	Sedimentary rocks only
300	5/5-21E1	Sonoma Valley	Kunkel and Upson (1960)	38.2656	-122.4265	550173	4235230	5	5	21	E	1	12.2	76.2	Sedimentary rocks only
301	5/6-24K1	Sonoma Valley	Kunkel and Upson (1960)	38.2635	-122.4725	546148	4234972	5	6	24	K	1	12.5	46.0	Sedimentary rocks only

**Appendix 1. Well Location Data.—Continued**

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Site ID	Well number	Area	Water-Supply Paper	Latitude	Longitude	Easting	Northing	Township (N)	Range (W)	Section	Quarter-quarter section designation	Well number within quarter-quarter section	Land surface elevation, in meters	Total depth of well, in meters	Geologic units intersected
302	5/5-22L1	Sonoma Valley	Kunkel and Upson (1960)	38.2631	-122.4040	552137	4234969	5	5	22	L	1	48.8	170.7	Sedimentary and volcanic rocks
303	5/5-19L5	Sonoma Valley	Kunkel and Upson (1960)	38.2629	-122.4564	547556	4234921	5	5	19	L	5	12.2	19.8	Sedimentary rocks only
304	5/5-22L2	Sonoma Valley	Kunkel and Upson (1960)	38.2625	-122.4014	552373	4234899	5	5	22	L	2	55.5	64.6	Sedimentary and volcanic rocks
305	5/5-19L1	Sonoma Valley	Kunkel and Upson (1960)	38.2607	-122.4571	547498	4234678	5	5	19	L	1	12.2	45.7	Sedimentary rocks only
306	5/5-22C1	Sonoma Valley	Kunkel and Upson (1960)	38.2598	-122.3992	552564	4234604	5	5	22	Q	1	54.9	165.2	Sedimentary and volcanic rocks
307	5/5-20R1	Sonoma Valley	Kunkel and Upson (1960)	38.2599	-122.4286	549987	4234601	5	5	20	R	1	11.3	153.6	Sedimentary rocks only
308	5/5-21R1	Sonoma Valley	Kunkel and Upson (1960)	38.2584	-122.4142	551251	4234439	5	5	21	R	1	24.4	73.8	Sedimentary rocks only
309	5/5-30E1	Sonoma Valley	Kunkel and Upson (1960)	38.2550	-122.4606	547195	4234043	5	5	30	E	1	7.6	230.1	Sedimentary and volcanic rocks
310	5/5-27H1	Sonoma Valley	Kunkel and Upson (1960)	38.2534	-122.3936	553057	4233898	5	5	27	H	1	53.3	228.6	Sedimentary and volcanic rocks
311	6/6-9R1	Santa Rosa Valley	Cardwell (1958)	38.2476	-122.4160	551100	4233237	6	6	9	R	1	96.4	58.8	Sedimentary and volcanic rocks
312	6/6-16B1	Santa Rosa Valley	Cardwell (1958)	38.2464	-122.4177	550952	4233110	6	6	16	B	1	147.0	129.8	Sedimentary rocks only
313	5/6-25P1	Sonoma Valley	Kunkel and Upson (1960)	38.2436	-122.4750	545940	4232771	5	6	25	P	1	11.0	52.1	Sedimentary rocks only
314	5/5-31A1	Sonoma Valley	Kunkel and Upson (1960)	38.2403	-122.4470	548398	4232410	5	5	31	A	1	3.0	124.4	Sedimentary rocks only
315	5/5-31H1	Sonoma Valley	Kunkel and Upson (1960)	38.2397	-122.4482	548287	4232353	5	5	31	H	1	2.1	61.9	Sedimentary rocks only
316	4/5-3C1	Sonoma Valley	Kunkel and Upson (1960)	38.2294	-122.4044	552128	4231228	4	5	3	C	1	9.1	79.6	Sedimentary rocks only
317	4/5-14D2	Sonoma Valley	Kunkel and Upson (1960)	38.1974	-122.3908	553348	4227691	4	5	14	D	2	0.0	493.8	Sedimentary rocks only
318	4/5-14D1	Sonoma Valley	Kunkel and Upson (1960)	38.1974	-122.3908	553348	4227688	4	5	14	D	1	0.0	164.6	Sedimentary rocks only
319	4/5-14L1	Sonoma Valley	Kunkel and Upson (1960)	38.1908	-122.3854	553820	4226960	4	5	14	L	1	0.0	201.2	Sedimentary rocks only
320	9/7-26C1	Napa Valley	Kunkel and Upson (1960)	38.6050	-122.6070	534223	4272813	9	7	26	C	1	134.1	137.2	Sedimentary and volcanic rocks
321	9/7-26G1	Napa Valley	Kunkel and Upson (1960)	38.6014	-122.6001	534821	4272411	9	7	26	G	1	129.5	93.0	Sedimentary and volcanic rocks
322	8/6-14R1	Napa Valley	Kunkel and Upson (1960)	38.5383	-122.4862	544780	4265466	8	6	14	R	1	88.4	40.2	Sedimentary and volcanic rocks
323	8/6-23M1	Napa Valley	Kunkel and Upson (1960)	38.5290	-122.5005	543536	4264421	8	6	23	M	1	86.9	39.3	Sedimentary rocks only
324	7/5-15A1	Napa Valley	Kunkel and Upson (1960)	38.4621	-122.3960	552695	4257049	7	5	15	A	1	43.6	108.2	Sedimentary rocks only
325	7/5-14G1	Napa Valley	Kunkel and Upson (1960)	38.4615	-122.3810	554009	4256996	7	5	14	G	1	42.4	80.8	Sedimentary and volcanic rocks
326	7/5-16L1	Napa Valley	Kunkel and Upson (1960)	38.4559	-122.4214	550481	4256356	7	5	16	L	1	52.1	67.4	Sedimentary rocks only
327	7/5-17J1	Napa Valley	Kunkel and Upson (1960)	38.4549	-122.4338	549402	4256229	7	5	17	J	1	61.0	171.9	Sedimentary and volcanic rocks
328	7/5-16N1	Napa Valley	Kunkel and Upson (1960)	38.4540	-122.4247	550197	4256135	7	5	16	N	1	52.7	76.8	Sedimentary rocks only
329	7/5-23L1	Napa Valley	Kunkel and Upson (1960)	38.4436	-122.3824	553894	4255010	7	5	23	L	1	36.6	45.7	Sedimentary rocks only
330	7/5-27D1	Napa Valley	Kunkel and Upson (1960)	38.4340	-122.4057	551867	4253931	7	5	27	D	1	51.8	125.0	Sedimentary and volcanic rocks
331	7/4-30L1	Napa Valley	Kunkel and Upson (1960)	38.4258	-122.3456	557123	4253055	7	4	30	L	1	34.1	52.1	Sedimentary and volcanic rocks
332	7/4-31E1	Napa Valley	Kunkel and Upson (1960)	38.4170	-122.3530	556481	4252070	7	4	31	E	1	27.4	82.9	Sedimentary rocks only
333	7/5-36N1	Napa Valley	Kunkel and Upson (1960)	38.4075	-122.3719	554843	4251014	7	5	36	N	1	43.0	31.7	Sedimentary and volcanic rocks
334	6/5-1C3	Napa Valley	Kunkel and Upson (1960)	38.4060	-122.3646	555477	4250851	6	5	1	C	3	35.1	38.1	Sedimentary rocks only
335	6/4-5A1	Napa Valley	Kunkel and Upson (1960)	38.4043	-122.3213	559259	4250683	6	4	5	A	1	32.6	97.2	Sedimentary rocks and pre-Cenozoic rocks
336	6/4-5B1	Napa Valley	Kunkel and Upson (1960)	38.4028	-122.3242	559005	4250514	6	4	5	B	1	32.6	17.7	Sedimentary rocks and pre-Cenozoic rocks
337	6/4-5B2	Napa Valley	Kunkel and Upson (1960)	38.4028	-122.3243	559002	4250514	6	4	5	B	2	32.6	8.7	Sedimentary rocks and pre-Cenozoic rocks
338	6/4-4E1	Napa Valley	Kunkel and Upson (1960)	38.3976	-122.3154	559778	4249947	6	4	4	E	1	33.5	182.9	Sedimentary and volcanic rocks
339	6/4-5J1	Napa Valley	Kunkel and Upson (1960)	38.3957	-122.3208	559311	4249734	6	4	5	J	1	32.6	89.0	Sedimentary rocks and pre-Cenozoic rocks
340	6/4-6R1	Napa Valley	Kunkel and Upson (1960)	38.3926	-122.3370	557897	4249374	6	4	6	R	1	30.5	73.8	Sedimentary rocks only
341	6/4-6R2	Napa Valley	Kunkel and Upson (1960)	38.3925	-122.3370	557897	4249370	6	4	6	R	2	30.5	67.1	Sedimentary and volcanic rocks
342	6/4-6P1	Napa Valley	Kunkel and Upson (1960)	38.3915	-122.3468	557046	4249249	6	4	6	P	1	22.9	36.6	Sedimentary rocks only
343	6/4-5Q1	Napa Valley	Kunkel and Upson (1960)	38.3900	-122.3228	559141	4249094	6	4	5	Q	1	19.8	50.9	Sedimentary rocks and pre-Cenozoic rocks
344	6/4-17A1	Napa Valley	Kunkel and Upson (1960)	38.3729	-122.3181	559562	4247199	6	4	17	A	1	20.4	76.2	Sedimentary rocks only
345	6/4-18A3	Napa Valley	Kunkel and Upson (1960)	38.3729	-122.3364	557966	4247189	6	4	18	A	3	25.0	222.5	Sedimentary and volcanic rocks

**Appendix 1. Well Location Data.—Continued**

[Site IDs correspond to locations shown on Plate 1; Well number and area correspond to descriptions in the Water-Supply Paper listed; latitude and longitude geographic coordinates have a horizontal datum of North American Datum 1927; Easting and Northing coordinates are in Universal Transverse Mercator projection zone 10, North American Datum 1927; system of quarter-quarter section designation is explained in the Water-Supply Papers; leaders (-), well number not assigned]

Site ID	Well number	Area	Water-Supply Paper	Latitude	Longitude	Easting	Northing	Township (N)	Range (W)	Section	Quarter-quarter section designation	Well number within quarter-quarter section	Land surface elevation, in meters	Total depth of well, in meters	Geologic units intersected
346	6/4-15Q1	Napa Valley	Kunkel and Upson (1960)	38.3605	-122.2863	562358	4245847	6	4	15	Q	1	20.4	92.4	Sedimentary and volcanic rocks
347	6/4-15Q3	Napa Valley	Kunkel and Upson (1960)	38.3604	-122.2900	562028	4245837	6	4	15	Q	3	19.8	99.7	Sedimentary rocks only
348	6/4-22B3	Napa Valley	Kunkel and Upson (1960)	38.3593	-122.2853	562444	4245713	6	4	22	B	3	26.2	72.2	Sedimentary rocks only
349	6/4-22B2	Napa Valley	Kunkel and Upson (1960)	38.3582	-122.2862	562369	4245589	6	4	22	B	2	18.3	35.7	Sedimentary rocks only
350	6/4-19B1	Napa Valley	Kunkel and Upson (1960)	38.3570	-122.3436	557351	4245419	6	4	19	B	1	38.1	38.1	Sedimentary and volcanic rocks
351	6/4-23F1	Napa Valley	Kunkel and Upson (1960)	38.3550	-122.2735	563474	4245248	6	4	23	F	1	22.9	67.1	Sedimentary and volcanic rocks
352	6/3-19M1	Napa Valley	Kunkel and Upson (1960)	38.3502	-122.2416	566269	4244738	6	3	19	M	1	164.6	57.9	Volcanic rocks only
353	6/4-23J1	Napa Valley	Kunkel and Upson (1960)	38.3488	-122.2635	564357	4244565	6	4	23	J	1	26.5	213.4	Sedimentary and volcanic rocks
354	6/4-21Q1	Napa Valley	Kunkel and Upson (1960)	38.3481	-122.3073	560532	4244459	6	4	21	Q	1	20.1	33.5	Sedimentary rocks only
355	6/4-27C2	Napa Valley	Kunkel and Upson (1960)	38.3441	-122.2910	561957	4244028	6	4	27	C	2	12.2	73.2	Sedimentary rocks only
356	6/4-30C1	Napa Valley	Kunkel and Upson (1960)	38.3440	-122.3471	557053	4243976	6	4	30	C	1	46.3	34.7	Sedimentary rocks only
357	6/4-25B1	Napa Valley	Kunkel and Upson (1960)	38.3431	-122.2508	565475	4243948	6	4	25	B	1	48.8	39.3	Sedimentary and volcanic rocks
358	6/4-25B2	Napa Valley	Kunkel and Upson (1960)	38.3431	-122.2541	565181	4243938	6	4	25	B	2	36.6	56.4	Sedimentary and volcanic rocks
359	6/4-25D1	Napa Valley	Kunkel and Upson (1960)	38.3420	-122.2597	564695	4243815	6	4	25	D	1	29.0	93.0	Sedimentary and volcanic rocks
360	6/4-26H1	Napa Valley	Kunkel and Upson (1960)	38.3400	-122.2634	564371	4243588	6	4	26	H	1	25.9	196.0	Sedimentary and volcanic rocks
361	6/4-28F1	Napa Valley	Kunkel and Upson (1960)	38.3386	-122.3114	560178	4243405	6	4	28	F	1	20.7	29.0	Sedimentary rocks only
362	6/4-26F1	Napa Valley	Kunkel and Upson (1960)	38.3373	-122.2742	563435	4243282	6	4	26	F	1	18.9	62.2	Sedimentary and volcanic rocks
363	6/4-28K2	Napa Valley	Kunkel and Upson (1960)	38.3369	-122.3066	560605	4243212	6	4	28	K	2	18.9	47.2	Sedimentary rocks only
364	6/4-26L2	Napa Valley	Kunkel and Upson (1960)	38.3350	-122.2765	563233	4243026	6	4	26	L	2	15.2	54.9	Sedimentary and volcanic rocks
365	6/4-26L1	Napa Valley	Kunkel and Upson (1960)	38.3345	-122.2753	563334	4242969	6	4	26	L	1	16.2	75.9	Sedimentary and volcanic rocks
366	6/4-27M1	Napa Valley	Kunkel and Upson (1960)	38.3338	-122.2991	561260	4242882	6	4	27	M	1	16.8	32.9	Sedimentary rocks only
367	6/4-26N1	Napa Valley	Kunkel and Upson (1960)	38.3328	-122.2802	562914	4242780	6	4	26	N	1	9.8	45.7	Sedimentary rocks only
368	6/4-27N1	Napa Valley	Kunkel and Upson (1960)	38.3327	-122.2987	561291	4242761	6	4	27	N	1	15.2	43.0	Sedimentary rocks only
369	6/4-28C1	Napa Valley	Kunkel and Upson (1960)	38.3313	-122.3041	560824	4242597	6	4	28	Q	1	17.4	24.7	Sedimentary rocks only
370	6/4-34D2	Napa Valley	Kunkel and Upson (1960)	38.3297	-122.2976	561392	4242419	6	4	34	D	2	13.1	115.8	Sedimentary rocks only
371	6/4-36C1	Napa Valley	Kunkel and Upson (1960)	38.3292	-122.2589	564779	4242390	6	4	36	C	1	16.8	136.2	Sedimentary rocks only
372	6/4-35G2	Napa Valley	Kunkel and Upson (1960)	38.3247	-122.2708	563738	4241892	6	4	35	G	2	11.3	78.6	Sedimentary and volcanic rocks
373	6/4-35G3	Napa Valley	Kunkel and Upson (1960)	38.3247	-122.2709	563735	4241892	6	4	35	G	3	11.6	79.2	Sedimentary and volcanic rocks
374	6/4-35G4	Napa Valley	Kunkel and Upson (1960)	38.3246	-122.2720	563634	4241873	6	4	35	G	4	8.2	76.2	Sedimentary and volcanic rocks
375	6/4-33L2	Napa Valley	Kunkel and Upson (1960)	38.3229	-122.3120	560143	4241659	6	4	33	L	2	22.9	61.6	Sedimentary rocks only
376	6/4-35L2	Napa Valley	Kunkel and Upson (1960)	38.3225	-122.2732	563534	4241644	6	4	35	L	2	7.6	79.2	Sedimentary and volcanic rocks
377	6/4-36J1	Napa Valley	Kunkel and Upson (1960)	38.3218	-122.2487	565672	4241582	6	4	36	J	1	39.6	131.7	Sedimentary rocks only
378	6/4-36L1	Napa Valley	Kunkel and Upson (1960)	38.3204	-122.2564	565003	4241423	6	4	36	L	1	18.3	74.1	Sedimentary and volcanic rocks
379	6/4-32J1	Napa Valley	Kunkel and Upson (1960)	38.3208	-122.3209	559369	4241420	6	4	32	J	1	29.6	144.8	Sedimentary rocks only
380	6/4-33M1	Napa Valley	Kunkel and Upson (1960)	38.3193	-122.3142	559949	4241256	6	4	33	M	1	25.9	53.6	Sedimentary rocks only
381	6/4-35P2	Napa Valley	Kunkel and Upson (1960)	38.3182	-122.2764	563257	4241159	6	4	35	P	2	6.7	32.0	Sedimentary and volcanic rocks
382	6/4-32N1	Napa Valley	Kunkel and Upson (1960)	38.3180	-122.3323	558370	4241107	6	4	32	N	1	42.7	158.2	Sedimentary rocks only
383	6/4-35Q1	Napa Valley	Kunkel and Upson (1960)	38.3164	-122.2702	563799	4240966	6	4	35	Q	1	42.7	58.5	Volcanic rocks only
384	6/4-35R1	Napa Valley	Kunkel and Upson (1960)	38.3161	-122.2677	564019	4240930	6	4	35	R	1	70.1	116.4	Sedimentary and volcanic rocks
385	5/4-2B1	Napa Valley	Kunkel and Upson (1960)	38.3139	-122.2725	563599	4240689	5	4	2	B	1	21.3	61.6	Sedimentary and volcanic rocks
386	5/4-1G1	Napa Valley	Kunkel and Upson (1960)	38.3103	-122.2553	565105	4240294	5	4	1	G	1	43.3	23.8	Sedimentary and volcanic rocks
387	5/4-5H4	Napa Valley	Kunkel and Upson (1960)	38.3095	-122.3199	559458	4240171	5	4	5	H	4	28.3	22.9	Sedimentary rocks only
388	5/3-6M2	Napa Valley	Kunkel and Upson (1960)	38.3075	-122.2453	565986	4239998	5	3	6	M	2	41.1	19.8	Sedimentary and volcanic rocks
389	5/3-6M1	Napa Valley	Kunkel and Upson (1960)	38.3069	-122.2431	566181	4239928	5	3	6	M	1	38.1	89.9	Sedimentary and volcanic rocks

**Appendix 1. Well Location Data.—Continued**

[Site IDs correspond to locations shown on Plate 1; Well number and area correspond to descriptions in the Water-Supply Paper listed; latitude and longitude geographic coordinates have a horizontal datum of North American Datum 1927; Easting and Northing coordinates are in Universal Transverse Mercator projection zone 10, North American Datum 1927; system of quarter-quarter section designation is explained in the Water-Supply Papers; leaders (-), well number not assigned]

Site ID	Well number	Area	Water-Supply Paper	Latitude	Longitude	Easting	Northing	Township (N)	Range (W)	Section	Quarter-quarter section designation	Well number within quarter-quarter section	Land surface elevation, in meters	Total depth of well, in meters	Geologic units intersected
390	5/4-3M1	Napa Valley	Kunkel and Upson (1960)	38.3062	-122.2988	561306	4239817	5	4	3	M	1	6.7	263.7	Sedimentary rocks only
391	5/3-5M2	Napa Valley	Kunkel and Upson (1960)	38.3057	-122.2288	567427	4239805	5	3	5	M	2	73.2	41.1	Sedimentary and volcanic rocks
392	5/3-6J1	Napa Valley	Kunkel and Upson (1960)	38.3053	-122.2316	567186	4239761	5	3	6	J	1	61.0	88.4	Sedimentary and volcanic rocks
393	5/4-4K2	Napa Valley	Kunkel and Upson (1960)	38.3049	-122.3086	560452	4239663	5	4	4	K	2	19.5	30.5	Sedimentary rocks only
394	5/3-5N3	Napa Valley	Kunkel and Upson (1960)	38.3040	-122.2252	567749	4239628	5	3	5	N	3	137.2	58.5	Sedimentary and volcanic rocks
395	5/3-5P1	Napa Valley	Kunkel and Upson (1960)	38.3040	-122.2232	567922	4239624	5	3	5	P	1	152.4	137.2	Sedimentary and volcanic rocks
396	5/4-5R1	Napa Valley	Kunkel and Upson (1960)	38.3045	-122.3197	559481	4239608	5	4	5	R	1	29.6	21.3	Sedimentary and volcanic rocks
397	5/3-6N2	Napa Valley	Kunkel and Upson (1960)	38.3039	-122.2430	566188	4239598	5	3	6	N	2	47.2	62.5	Sedimentary and volcanic rocks
398	5/4-5Q2	Napa Valley	Kunkel and Upson (1960)	38.3043	-122.3220	559285	4239584	5	4	5	Q	2	35.7	45.7	Sedimentary rocks only
399	5/4-1R1	Napa Valley	Kunkel and Upson (1960)	38.3037	-122.2501	565565	4239576	5	4	1	R	1	39.6	112.5	Sedimentary and volcanic rocks
400	5/3-6Q1	Napa Valley	Kunkel and Upson (1960)	38.3031	-122.2360	566804	4239513	5	3	6	Q	1	49.7	69.5	Sedimentary and volcanic rocks
401	5/3-5N1	Napa Valley	Kunkel and Upson (1960)	38.3026	-122.2265	567635	4239462	5	3	5	N	1	73.2	41.1	Sedimentary and volcanic rocks
402	5/3-6N1	Napa Valley	Kunkel and Upson (1960)	38.3018	-122.2467	565865	4239358	5	3	6	N	1	36.6	36.6	Sedimentary and volcanic rocks
403	5/3-6N3	Napa Valley	Kunkel and Upson (1960)	38.3014	-122.2446	566053	4239322	5	3	6	N	3	36.6	44.5	Sedimentary and volcanic rocks
404	5/4-3Q1	Napa Valley	Kunkel and Upson (1960)	38.3013	-122.2901	562075	4239282	5	4	3	Q	1	6.7	73.5	Sedimentary rocks only
405	5/4-12B1	Napa Valley	Kunkel and Upson (1960)	38.2996	-122.2551	565134	4239109	5	4	12	B	1	36.6	45.7	Sedimentary and volcanic rocks
406	5/3-8C1	Napa Valley	Kunkel and Upson (1960)	38.2991	-122.2222	568014	4239086	5	3	8	C	1	88.4	29.0	Sedimentary and volcanic rocks
407	5/3-7D1	Napa Valley	Kunkel and Upson (1960)	38.2987	-122.2454	565982	4239015	5	3	7	D	1	38.1	44.2	Sedimentary and volcanic rocks
408	5/4-9D1	Napa Valley	Kunkel and Upson (1960)	38.2987	-122.3162	559794	4238971	5	4	9	D	1	36.6	41.1	Sedimentary and volcanic rocks
409	5/4-12E1	Napa Valley	Kunkel and Upson (1960)	38.2974	-122.2631	564435	4238866	5	4	12	E	1	36.6	77.7	Sedimentary and volcanic rocks
410	5/3-7E3	Napa Valley	Kunkel and Upson (1960)	38.2971	-122.2466	565882	4238837	5	3	7	E	3	36.0	145.7	Sedimentary and volcanic rocks
411	5/4-11E1	Napa Valley	Kunkel and Upson (1960)	38.2971	-122.2799	562965	4238821	5	4	11	E	1	7.6	213.4	Sedimentary rocks only
412	5/4-9E1	Napa Valley	Kunkel and Upson (1960)	38.2966	-122.3162	559797	4238734	5	4	9	E	1	48.8	115.8	Sedimentary and volcanic rocks
413	5/4-12J1	Napa Valley	Kunkel and Upson (1960)	38.2939	-122.2500	565588	4238489	5	4	12	J	1	23.8	92.4	Sedimentary and volcanic rocks
414	5/4-9K2	Napa Valley	Kunkel and Upson (1960)	38.2937	-122.3071	560596	4238422	5	4	9	K	2	12.8	32.9	Sedimentary rocks only
415	5/4-11L3	Napa Valley	Kunkel and Upson (1960)	38.2935	-122.2734	563536	4238421	5	4	11	L	3	7.6	21.0	Sedimentary and volcanic rocks
416	5/4-9L1	Napa Valley	Kunkel and Upson (1960)	38.2917	-122.3131	560069	4238201	5	4	9	L	1	24.4	78.6	Sedimentary rocks only
417	5/4-9Q1	Napa Valley	Kunkel and Upson (1960)	38.2895	-122.3071	560596	4237954	5	4	9	Q	1	10.7	54.3	Sedimentary rocks only
418	5/4-10P4	Napa Valley	Kunkel and Upson (1960)	38.2874	-122.2766	563268	4237745	5	4	10	P	4	7.6	91.4	Sedimentary rocks only
419	5/4-14C1	Napa Valley	Kunkel and Upson (1960)	38.2852	-122.2765	563278	4237497	5	4	14	C	1	5.2	67.1	Sedimentary rocks only
420	5/4-15C2	Napa Valley	Kunkel and Upson (1960)	38.2844	-122.2946	561692	4237403	5	4	15	C	2	6.7	26.4	Sedimentary rocks only
421	5/3-17C1	Napa Valley	Kunkel and Upson (1960)	38.2838	-122.2218	568066	4237383	5	3	17	C	1	182.9	79.6	Volcanic rocks only
422	5/4-13E1	Napa Valley	Kunkel and Upson (1960)	38.2828	-122.2632	564442	4237248	5	4	13	E	1	18.3	46.6	Sedimentary rocks only
423	5/4-14H3	Napa Valley	Kunkel and Upson (1960)	38.2824	-122.2672	564093	4237194	5	4	14	H	3	17.1	73.2	Sedimentary rocks only
424	5/4-17F1	Napa Valley	Kunkel and Upson (1960)	38.2813	-122.3261	558943	4237031	5	4	17	F	1	3.0	48.8	Sedimentary rocks only
425	5/4-13L1	Napa Valley	Kunkel and Upson (1960)	38.2799	-122.2590	564810	4236925	5	3	13	L	1	25.3	275.5	Sedimentary and volcanic rocks
426	5/4-14L2	Napa Valley	Kunkel and Upson (1960)	38.2780	-122.2748	563434	4236704	5	4	14	L	2	4.9	99.1	Sedimentary and volcanic rocks
427	5/4-14L1	Napa Valley	Kunkel and Upson (1960)	38.2780	-122.2748	563434	4236701	5	4	14	L	1	4.4	160.0	Sedimentary and volcanic rocks
428	5/4-15K1	Napa Valley	Kunkel and Upson (1960)	38.2777	-122.2871	562353	4236662	5	4	15	K	1	1.8	356.0	Sedimentary and volcanic rocks
429	5/4-14P1	Napa Valley	Kunkel and Upson (1960)	38.2758	-122.2765	563284	4236454	5	4	14	P	1	3.0	182.9	Sedimentary and volcanic rocks
430	5/4-15P2	Napa Valley	Kunkel and Upson (1960)	38.2728	-122.2947	561692	4236107	5	4	15	P	2	3.0	370.0	Sedimentary and volcanic rocks
431	5/4-21A1	Napa Valley	Kunkel and Upson (1960)	38.2720	-122.3033	560943	4236023	5	4	21	A	1	10.7	166.1	Sedimentary and volcanic rocks
432	5/4-19J1	Napa Valley	Kunkel and Upson (1960)	38.2621	-122.3387	557855	4234897	5	4	19	J	1	32.0	30.5	Sedimentary rocks only
433	5/4-19J2	Napa Valley	Kunkel and Upson (1960)	38.2615	-122.3394	557793	4234826	5	4	19	J	2	30.5	32.9	Sedimentary rocks only

**Appendix 1. Well Location Data.—Continued**

[Site IDs correspond to locations shown on Plate 1; Well number and area correspond to descriptions in the Water-Supply Paper listed; latitude and longitude geographic coordinates have a horizontal datum of North American Datum 1927; Easting and Northing coordinates are in Universal Transverse Mercator projection zone 10, North American Datum 1927; system of quarter-quarter section designation is explained in the Water-Supply Papers; leaders (-), well number not assigned]

Site ID	Well number	Area	Water-Supply Paper	Latitude	Longitude	Easting	Northing	Township (N)	Range (W)	Section	Quarter-quarter section designation	Well number within quarter-quarter section	Land surface elevation, in meters	Total depth of well, in meters	Geologic units intersected
434	5/4-21P2	Napa Valley	Kunkel and Upson (1960)	38.2592	-122.3135	560065	4234589	5	4	21	P	2	7.6	71.6	Sedimentary rocks only
435	5/4-19R1	Napa Valley	Kunkel and Upson (1960)	38.2582	-122.3359	558106	4234467	5	4	19	R	1	38.1	41.1	Sedimentary rocks only
436	5/4-19Q1	Napa Valley	Kunkel and Upson (1960)	38.2579	-122.3409	557666	4234424	5	4	19	Q	1	30.5	53.3	Sedimentary rocks only
437	5/4-27A1	Napa Valley	Kunkel and Upson (1960)	38.2568	-122.2832	562714	4234343	5	4	27	A	1	2.2	242.3	Sedimentary and volcanic rocks
438	5/4-30B2	Napa Valley	Kunkel and Upson (1960)	38.2566	-122.3430	557484	4234283	5	4	30	B	2	33.5	173.7	Sedimentary and volcanic rocks
439	5/4-26B1	Napa Valley	Kunkel and Upson (1960)	38.2560	-122.2725	563651	4234262	5	4	26	B	1	6.1	438.9	Sedimentary and volcanic rocks
440	5/4-26E1	Napa Valley	Kunkel and Upson (1960)	38.2553	-122.2793	563054	4234184	5	4	26	E	1	2.4	245.7	Sedimentary and volcanic rocks
441	5/4-27H2	Napa Valley	Kunkel and Upson (1960)	38.2546	-122.2835	562692	4234105	5	4	27	H	2	2.4	262.1	Sedimentary and volcanic rocks
442	5/5-26G1	Napa Valley	Kunkel and Upson (1960)	38.2546	-122.3798	554261	4234042	5	5	26	G	1	86.9	125.0	Sedimentary and volcanic rocks
443	5/4-27H1	Napa Valley	Kunkel and Upson (1960)	38.2533	-122.2863	562445	4233951	5	4	27	H	1	2.4	373.7	Sedimentary and volcanic rocks
444	5/4-29F1	Napa Valley	Kunkel and Upson (1960)	38.2526	-122.3267	558916	4233852	5	4	29	F	1	28.3	32.3	Sedimentary rocks only
445	5/4-27K2	Napa Valley	Kunkel and Upson (1960)	38.2518	-122.2887	562238	4233781	5	4	27	K	2	2.4	139.0	Sedimentary and volcanic rocks
446	5/4-26M1	Napa Valley	Kunkel and Upson (1960)	38.2500	-122.2806	562947	4233593	5	4	26	M	1	2.3	286.2	Sedimentary and volcanic rocks
447	5/4-27K1	Napa Valley	Kunkel and Upson (1960)	38.2500	-122.2868	562402	4233592	5	4	27	K	1	2.4	84.1	Sedimentary and volcanic rocks
448	5/4-26M2	Napa Valley	Kunkel and Upson (1960)	38.2493	-122.2808	562931	4233513	5	4	26	M	2	1.0	207.9	Sedimentary and volcanic rocks
449	5/4-29K1	Napa Valley	Kunkel and Upson (1960)	38.2487	-122.3261	558971	4233416	5	4	29	K	1	24.4	32.0	Sedimentary rocks only
450	5/4-26N1	Napa Valley	Kunkel and Upson (1960)	38.2481	-122.2793	563067	4233380	5	4	26	N	1	2.4	137.2	Sedimentary and volcanic rocks
451	5/4-29N2	Napa Valley	Kunkel and Upson (1960)	38.2477	-122.3321	558446	4233302	5	4	26	N	2	21.9	94.5	Sedimentary rocks only
452	5/4-30R1	Napa Valley	Kunkel and Upson (1960)	38.2472	-122.3355	558144	4233248	5	4	30	R	1	21.3	426.7	Sedimentary rocks only
453	5/4-29N1	Napa Valley	Kunkel and Upson (1960)	38.2471	-122.3336	558315	4233234	5	4	29	N	1	21.9	10.1	Hydrology data only; no geologic information
454	5/4-29Q1	Napa Valley	Kunkel and Upson (1960)	38.2467	-122.3236	559191	4233194	5	4	29	Q	1	23.5	51.8	Sedimentary rocks only
455	5/4-29Q2	Napa Valley	Kunkel and Upson (1960)	38.2465	-122.3225	559286	4233172	5	4	29	Q	2	21.3	45.4	Sedimentary rocks only
456	5/4-27R1	Napa Valley	Kunkel and Upson (1960)	38.2461	-122.2858	562494	4233160	5	4	27	R	1	1.0	147.8	Sedimentary and volcanic rocks
457	5/4-30P1	Napa Valley	Kunkel and Upson (1960)	38.2461	-122.3470	557141	4233115	5	4	30	P	1	36.0	105.8	Sedimentary rocks only
458	5/4-27Q1	Napa Valley	Kunkel and Upson (1960)	38.2457	-122.2887	562241	4233113	5	4	27	Q	1	2.0	217.0	Sedimentary rocks and pre-Cenozoic rocks
459	5/4-27R2	Napa Valley	Kunkel and Upson (1960)	38.2450	-122.2846	562602	4233036	5	4	27	M	1	1.5	100.6	Sedimentary and volcanic rocks
460	5/4-35R4	Napa Valley	Kunkel and Upson (1960)	38.2321	-122.2667	564181	4231619	5	4	35	R	4	7.0	368.2	Sedimentary rocks and pre-Cenozoic rocks
461	4/4-4C1	Napa Valley	Kunkel and Upson (1960)	38.2297	-122.3109	560314	4231316	4	4	4	C	1	3.7	24.4	Sedimentary rocks only
462	4/4-5C1	Napa Valley	Kunkel and Upson (1960)	38.2293	-122.3274	558871	4231262	4	4	5	C	1	9.1	47.2	Sedimentary rocks only
463	4/4-16D1	Napa Valley	Kunkel and Upson (1960)	38.1985	-122.3170	559804	4227859	4	4	16	D	1	0.0	70.4	Sedimentary rocks only
464	4/4-16E1	Napa Valley	Kunkel and Upson (1960)	38.1937	-122.3166	559840	4227316	4	4	16	E	1	0.0	93.3	Sedimentary rocks only

## Appendix 2. Hydrologic data.

[Site IDs and well number correspond to locations in Appendix 1; leaders (--), not reported]

Site ID	Well number	Reported geologic unit present in water interval <sup>1</sup>	Simplified geologic unit present in water interval <sup>2</sup>	Reported lithology in water-bearing interval <sup>3</sup>	Interpreted lithologic class in water-bearing interval <sup>4</sup>	Well type <sup>5</sup>	Casing diameter, in inches <sup>6</sup>	Date Water level Measured <sup>7</sup>	Water level distance below land surface datum, in ft	Discharge, in gal/min	Pump test duration, in hours	Bailing or pumping rate, in gal/min <sup>8</sup>	Drawdown, in ft <sup>9</sup>	Temperature, in °F	Use	Comment
1	22/13-2A3	--	--	--	--	D	--	1/1/1948	--	--	--	150	--	--	--	--
2	22/12-18N1	Qal	Qal	soil	Sand and clay	DC	14	4/3/1952	2.84	--	--	150	50	--	Stock	--
3	22/12-19G2	Qal	Qal	gravel and yellow clay	Clay and gravel	DR, G	12-10	10/30/1952	31.4	--	--	--	--	--	Irrigation	--
4	21/15-12K2	Qal, Qt (?)	Qal, QTc	yellow clay	Clay	DC	8	9/16/1940	16	--	--	7	1	--	Abandoned	--
5	21/15-13B1	Qal	Qal	surface soil	Sand and clay	DR, G	12-8	6/15/1951	Flowing	--	60	700	18	--	Public supply	--
6	21/15-14A1	Qt	Qal	yellow clay and gravel	Clay and gravel	DC	8	3/15/1951	3	--	--	10	38	--	Domestic	--
7	21/14-30M1	Qal	Qal	blue clay	Clay	Dug	60	11/19/1952	16.2	--	--	--	--	--	--	--
8	21/14-31J1	Qal	Qal	yellow clay and pea gravel	Clay and gravel	DR, G	10	10/23/1953	12.02	--	--	--	--	--	Irrigation	--
9	18/13-18H1	--	--	--	Sand (or sandstone) and gravel	DR, G	10	6/9/1953	--	--	--	952	90	64.0	Irrigation	--
10	18/13-19B1	Qal	Qal	sand and gravel	DR, G	12-10	7/14/1954	182.5	--	--	190	210	67.0	Industrial, irrigation	--	
11	18/13-20P2	Tp	Tp	yellow clay	Clay	DC	8	7/14/1955	3	--	--	15	--	--	Irrigation	--
12	18/13-31A1	Tp	Tp	yellow clay and gravel	Clay and gravel	DC	8	9/28/1939	26	--	--	10	144	--	Domestic	--
13	17/11-33D1	Qt (?)	Qal	yellow clay	Clay	DR	8	9/23/1952	13	--	--	5	--	64.0	Unused	--
14	16/12W-34N2	--	--	--	Sand (or sandstone) and gravel	D	--	1/1/1953	--	--	--	--	--	--	--	--
15	14/12-5K1	Qyal	Qal	yellow sand, clay and gravel	DC	8	11/8/1952	38	--	--	--	5	56	--	Domestic, irrigation	--
16	14/12-26H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
17	13/11-8H1	Tp	Tp	medium gravelly brown soil	Clay, sand, and gravel	DC	8	11/1/1936	10	--	--	75	70	--	--	--
18	13/11-18D1	Qal	Qal	sand	Sand	DR, G	16	8/23/1950	15	--	--	100	5	--	Irrigation	--
19	13/11-18M1	Qal	Qal	topsoil	Sand and clay	Dug, DC	60 (Dug), 8 (DC)	6/23/1953	9.4	--	--	550	--	--	Irrigation, stock	--
20	13/11-22G	--	--	--	--	--	--	--	--	--	--	100	--	--	--	--
21	13/11-21L2	Qal	Qal	gravel	Gravel	DR, G	12	8/14/1950	44	--	72	550	155	--	Unused	--
22	13/11-19Q1	--	--	--	--	DR	14	1/1/1949	--	--	--	900	--	--	Irrigation	--
23	11/10-17R1	Qal	Qal	brown silt, moist	Sand and clay	DC	6	5/26/1950	15	--	--	10	15	--	Domestic	--
24	11/10-28L1	--	--	--	--	DC	16	1/1/1952	--	--	--	--	--	--	Irrigation	--
25	11/10-33A	Qal	Qal	gravel (Dry)	Gravel	Dug	72	10/19/1951	11	--	--	1000	8	--	Industrial	--
26	10/11-12Q1	Qal	Qal, QTge	gravel and sand	Sand (or sandstone) and gravel	DR	10	11/5/1953	8.68	--	--	--	--	--	Irrigation	--
27	10/9-26L1	Qal, QTge	Qal, QTc	topsoil	Sand and clay	DR, G	10	7/19/1950	8.61	--	--	240	90	64.0	Irrigation	--
28	9/10-2B3	Qal, Qt, QTge (?)	Qal, QTc	bottom in soft clay and gravel	Clay and gravel	DC	12	1/15/1954	244.3	--	--	240	45	--	Unused	--
29	9/10-2B1	--	--	--	--	DR, G	12	1/1/1950	--	--	--	--	--	--	Irrigation	--
30	9/9-4E1	Qal, KJ(?)	Qal	topsoil	Sand and clay	DR, G	6	4/2/1952	4.04	--	--	--	--	60.0	Unused	--
31	9/8-7Q1	Qal, QTge	Qal, QTc	blue sand and large gravel	Sand (or sandstone) and gravel	DR, G	12	7/20/1950	23.29	--	--	250	195	--	Domestic, irrigation, stock	--
32	9/9-21R1	--	--	--	--	DC	6	1/1/1941	--	--	--	--	--	--	Abandoned	--
33	9/9-33E2	Qal	Qal	yellow clay	Clay	DC	8	5/16/1952	20	--	--	400	2	--	Irrigation	--
34	8/9-19K1	--	--	--	--	DC	8	1/1/1941	--	--	--	30	--	--	Domestic, irrigation	--
35	8/10-20M3	Qal	Qal	clay, yellow, and gravel	Clay and gravel	DC	12	3/1/1940	10	--	--	20	0	--	Domestic	--
36	8/10-29D1	--	--	--	--	DR, G	8	1/1/1951	--	--	--	110	50	--	Domestic, irrigation	--
37	8/10-29H2	Qal	Qal	top clay and sand	Sand (or sandstone) and gravel	D	16	10/15/1953	21.19	--	--	--	--	--	Public supply	--
38	8/10-29N1	Qal	Qal	blue clay	Clay	DC	8	11/28/1952	15	--	--	200	14	60.0	Domestic	--
39	8/9-31A1	Qt	Qal	yellow clay	Clay	DC	8	7/11/1952	10	--	--	43	53	--	Irrigation	--
40	8/9-32E3	--	--	--	--	DC	12	1/1/1953	--	--	--	60	50	--	Abandoned	--
41	7/10-7D1	--	--	--	--	D	12	7/11/1950	--	--	--	--	--	--	Public supply	--
42	7/11-11J1	Qal	Qal	sand	Sand	DC	12	9/12/1951	26.01	--	--	--	500	--	Abandoned	--
43	7/11-17J1	Qal	Qal	blue clay and gravel	Clay and gravel	D	12	10/15/1953	1.97	--	--	--	150	--	Irrigation	--
44	8/9-1M1	QTge	QTc	yellow clay	Clay	D	6	3/27/1951	69.7	--	--	12	28	--	Domestic	--
45	8/9-3P1	Qyal	Qal	black soil	Sand and clay	D	10	5/25/1950	0.72	--	--	90	63	65.0	Irrigation, stock	--
46	8/9-9H1	Qyal	Qal	loose yellow sand and gravel	Sand (or sandstone) and gravel	D	10	5/25/1950	12.23	--	--	350	3	64.0	Irrigation	--

**Appendix 2. Hydrologic data.—Continued**

[Site IDs and well number correspond to locations in Appendix 1; leaders (--), not reported]

Site ID	Well number	Reported geologic unit present in water interval <sup>1</sup>	Simplified geologic unit present in water interval <sup>2</sup>	Reported lithology in water-bearing interval <sup>3</sup>	Interpreted lithologic class in water-bearing interval <sup>4</sup>	Well type <sup>5</sup>	Casing diameter, in inches <sup>6</sup>	Date Water level Measured <sup>7</sup>	Water level distance below land surface datum, in ft	Discharge, in gal/min	Pump test duration, in hours	Bailing or pumping rate, in gal/min <sup>8</sup>	Drawdown, in ft <sup>9</sup>	Temperature, in °F	Use	Comment
47	8/9-10R1	QTge	QTc	--	--	D	10	1/10/1950	80.15	200	--	200	32	--	Domestic, dairy, irrigation	--
48	8/9-11P1	--	--	--	--	D	8	1/1/1948	--	--	--	120	--	--	Irrigation	--
49	8/9-15D1	Qyal, QTge (?)	QTc	topsoil	Sand and clay	D	10	4/26/1950	8	--	--	75	15	--	Irrigation	--
50	8/9-13C1	Qyal, QTge	QTc	yellow clay	Clay	D, G	10	6/1/1950	12	--	--	100	88	--	Public supply	--
51	8/9-14L1	--	--	--	--	D	8	11/9/1950	13	--	--	220	88	66.0	Irrigation	--
52	8/8-17L1	QTge	QTc	clay, yellow, and gravel; water at 103 feet	Clay and gravel	D	8	5/1/1947	103	6	--	10	132	--	Domestic	--
53	8/9-14P1	--	--	--	--	D, G	10	11/16/1949	10.68	--	--	400	110	--	Irrigation	--
54	8/9-13N1	QTge	QTc	gravel	Gravel	D	12	11/8/1949	27.42	--	--	425	105	--	Irrigation	--
55	8/8-20B2	--	--	--	--	D	8	8/15/1946	35	--	--	20	120	--	Domestic	--
56	8/8-20D1	QTge	QTc	--	--	D	10	4/28/1950	70	--	--	200	150	--	Irrigation	--
57	8/9-23G1	--	--	--	--	D, G	10	11/16/1949	4.48	--	--	200	70	--	Irrigation	--
58	8/9-24E1	Qyal (?), QTge	Qal, QTc	--	--	D	12–10	1/11/1950	3.09	--	--	600	60	--	Irrigation	--
59	8/9-23L1	QTge	QTc	coarse gravel	Gravel	D, G	12	11/16/1949	28.54	--	--	750	69	65.0	Irrigation	--
60	8/8-19M1	QTge	QTc	yellow sandy clay	Clay and sand (or sandstone)	D, G	12	10/19/1950	23.27	--	--	280	70	68.0	Domestic, industrial	--
61	8/8-19N1	--	--	--	--	D, G	10	4/19/1951	12	--	--	290	51	--	Irrigation	--
62	8/8-20Q1	--	--	--	--	D, G	10	6/1/1950	20	--	--	300	10	65.0	Domestic, irrigation	--
63	8/9-26D1	--	--	--	--	D	12	2/1/1948	20	450	--	485	70	66.0	irrigation	--
64	8/8-29C1	Qyal, QTge	QTc	yellow clay	Clay	D	6	11/21/1950	30	--	--	20	10	--	Domestic	--
65	8/8-29D1	Qyal, QTge	QTc	sandy blue clay	Clay and sand (or sandstone)	D	6	1/4/1951	8	--	--	30	16	--	Domestic	--
66	8/8-30G1	--	--	--	--	D	8	8/15/1950	15	--	--	40	65	--	Domestic, irrigation	--
67	8/8-30L1	QTge	QTc	clay, sandy, blue	Clay and sand (or sandstone)	D	12	10/21/1944	32	500	--	400	69	--	Industrial	--
68	8/9-27K1	QTge, QTm	QTc, Twg	clay hard, yellow	Clay	D	12	11/16/1949	16.1	800	--	--	--	--	Irrigation	--
69	8/8-30N1	QTge	QTc	clay, yellow, and gravel	Clay and gravel	D, G	12	8/17/1942	23	480	--	400	89	72.0	Industrial	--
70	8/8-30N2	QTge	QTc	clay, yellow, and gravel	Clay and gravel	D, G	12–8	3/27/1951	21.71	--	--	--	--	89.0	Unused	--
71	8/8-31B1	--	--	--	--	D	8	5/3/1947	22	--	--	50	31	--	Domestic, dairy, irrigation	--
72	8/9-33G1	--	--	--	--	D	--	1/1/1949	--	--	--	--	--	--	Unused	--
73	8/9-36G1	QTge, QTm	QTc, Twg	--	--	D	12	11/17/1949	16.08	--	--	--	--	--	Irrigation	--
74	8/9-36K1	--	--	--	--	D	12	11/17/1949	45.98	500	--	750	75	--	Irrigation	--
75	8/9-36L1	QTge	QTc	blue clay	Clay	D	12–8	11/18/1949	35.5	450	--	--	90	--	Irrigation	--
76	8/9-33J1	--	--	--	--	D	12	1/1/1945	--	--	--	70	--	--	Unused	--
77	8/9-35M1	Qyal, QTge, QTm	Qal, QTc	--	--	D	12	11/16/1949	15.18	800	--	--	--	--	Irrigation	--
78	8/9-35K1	QTge	QTc	clay, blue	Clay	D	12	11/16/1949	28.3	300	--	--	--	--	Irrigation	--
79	8/9-34R1	--	--	--	--	D	12	1/1/1933	--	900	--	900	35	--	Irrigation	--
80	8/8-34Q1	--	--	--	--	D	8–6	1/1/1948	--	--	--	--	--	--	Domestic, dairy, irrigation	--
81	8/9-36P1	Qyal	Qal	clay, blue	Clay	D	12–10	10/5/1949	22.56	650	--	--	150	--	Irrigation	--
82	7/9-2C1	Qyal, QTge, QTm	Qal, QTc	--	--	D	12	11/16/1949	14.01	1000	--	--	--	--	Irrigation	--
83	8/9-34R2	Qyal, QTge (?)	QTc	topsoil	Sand and clay	D, G	12	10/1/1949	9	--	--	--	--	--	Irrigation	--
84	7/8-3C1	--	--	--	--	D	8	8/3/1946	11	--	--	10	189	--	Domestic, stock	--
85	7/8-4B3	Qyal, QTge	QTc	gravel, cemented	Gravel	D	8	9/23/1941	33.8	--	--	120	72.7	--	Irrigation	--
86	7/7-5F1	QTge	QTc	clay, yellow, and gravel	Clay and gravel	D	8	5/1/1948	71	--	--	4	59	--	Domestic	--
87	7/7-5F2	--	--	--	--	D	8	3/29/1951	27.26	6	--	--	50	--	Domestic, irrigation, stock	--
88	7/9-3E1	QTm	Twg	blue sandstone	Sandstone	D	12–8	11/18/1949	41.45	5	--	--	--	--	Domestic	--
89	7/7-6G1	QTge	QTc	fine sand	Sand	D, G	8	6/5/1951	12.73	--	--	40	22	--	Domestic, irrigation	--
90	7/8-6H2	QTge	QTc	brown clay	Clay	D, G	10	3/15/1951	9.18	--	12	125	100	70.0	Irrigation	--
91	7/9-3M1	QTm	Twg	--	--	Dug, D	72 (Dug), 8 (D)	4/1/1949	35	12	--	17	--	--	Domestic	--

**Appendix 2. Hydrologic data.—Continued**

[Site IDs and well number correspond to locations in Appendix 1; leaders (--), not reported]

Site ID	Well number	Reported geologic unit present in water interval <sup>1</sup>	Simplified geologic unit present in water interval <sup>2</sup>	Reported lithology in water-bearing interval <sup>3</sup>	Interpreted lithologic class in water-bearing interval <sup>4</sup>	Well type <sup>5</sup>	Casing diameter, in inches <sup>6</sup>	Date Water level Measured <sup>7</sup>	Water level distance below land surface datum, in ft	Discharge, in gal/min	Pump test duration, in hours	Bailing or pumping rate, in gal/min <sup>8</sup>	Drawdown, in ft <sup>9</sup>	Temperature, in °F	Use	Comment
92	7/7-5N1	Qyal, QTge (?)	QTc	fine gravel	Gravel	D	8	6/21/1950	9.4	--	--	35	50	--	Domestic, irrigation	--
93	7/7-8A1	QTge	QTc	--	--	D	8	5/1/1947	128	--	--	--	--	--	Domestic	--
94	7/9-4N1	QTm	Twg	clay and sand, dry	Clay and sand (or sandstone)	D	8	4/18/1951	15.83	--	--	6	--	--	Domestic	--
95	7/9-5N1	QTm	Twg	sand, hard yellow	Sand	D	12	7/20/1950	32.62	77	--	74	100	--	Industrial	--
96	7/7-9D3	--	--	--	--	D	8	11/26/1948	11	--	--	20	154	--	Domestic	--
97	7/7-9D2	QTge	QTc	sandy clay and gravel	Clay, sand, and gravel	D	6	11/30/1950	15	--	--	10	40	--	Domestic	--
98	7/7-8A2	--	--	--	--	D	8	11/3/1948	1.4	6.5	--	30	117	--	Domestic	--
99	7/7-9D1	QTge	QTc	--	--	D	8	8/17/1950	32	--	--	15	60	--	Domestic	--
100	7/8-9D1	QTge	QTc	--	--	D	10	12/13/1949	12.83	150	--	--	--	--	Irrigation, stock	--
101	7/9-7G1	KJu	KJu	(cased to 40 ft.)	No data	D	6	7/20/1950	150	--	--	8	--	--	Domestic, dairy	--
102	7/8-11G1	QTge	QTc	--	--	D	8	2/1/1949	90	--	--	7	155	--	Domestic	--
103	7/7-8G2	QTge	QTc	--	--	D	10	5/26/1950	6.64	--	--	50	--	--	Dairy, irrigation	--
104	7/9-9F1	--	--	dry sand	Sand	D	7	12/1/1938	46	5	--	--	--	--	Domestic	--
105	7/8-12H1	Tsv	Tv	--	--	D	6	2/27/1950	75	--	--	15	50	--	Domestic	--
106	7/8-12E2	--	--	--	--	D	12	1/1/1948	--	300	--	450	171	--	Public supply	--
107	7/9-10E1	--	--	--	--	D	8	7/14/1950	46.75	--	--	--	--	62.0	--	--
108	7/7-8M2	--	--	--	--	D	8	12/8/1949	54	--	--	8	66	--	Domestic	--
109	7/7-7F2	--	--	--	--	D, G	8	1/1/1950	--	--	--	20	70	--	Domestic	--
110	7/9-8J1	--	--	yellow sand	Sand	D	8	8/10/1950	52.04	--	--	--	--	--	Domestic	--
111	7/8-11K1	QTge	QTc	--	--	D	8	7/2/1941	100	--	--	22	--	--	Domestic	--
112	7/8-10L1	QTge	QTc	--	--	D	12	10/13/1949	21.6	337	--	276	47.5	--	Unused	--
113	7/9-8K1	--	--	yellow sand and clay	Sand and clay	D	8-6	9/21/1949	90	--	--	3	200	--	Domestic	--
114	7/8-12K1	Tsv	Tv	--	--	D	5	11/14/1949	165	--	--	8	13	--	Domestic	--
115	7/8-12Q2	--	--	--	--	D	8	11/13/1949	123	--	--	20	27	--	Domestic	--
116	7/7-8P2	--	--	--	--	D	6	2/15/1951	50	--	--	9	60	--	Domestic	--
117	7/7-8L1	--	--	--	--	D	8	1/1/1949	--	--	--	12	90	--	Public supply	--
118	7/8-9R1	QTge	QTc	clay sandy brown	Clay and sand (or sandstone)	D	10	8/1/1948	9	--	--	100	20	--	Irrigation	--
119	7/8-14A1	Qyal, QTge	QTc	adobe	Sand and clay	D	8	4/11/1951	0.07	--	--	23	160	--	Unused	--
120	7/7-16A1	QTge	QTc	--	--	D	8-6	3/6/1951	80	--	--	30	5	--	Domestic	--
121	7/7-15C1	Qyal	Qal	boulders	Gravel	D	--	5/26/1950	4	1	--	20	160	--	Domestic, irrigation	--
122	7/7-17A1	Qyal, Qaoal (?)	Qal	boulders and gravel	Gravel	D	12	6/1/1947	84	--	--	485	64	--	Public supply	--
123	7/9-15E2	--	--	--	--	D	8	1/1/1945	--	--	--	--	--	--	Domestic	--
124	7/8-14D1	Qyal, QTge	QTc	clay	Clay	D	12	10/1/1945	12	--	--	270	56	--	Irrigation, public supply	--
125	7/8-14E1	QTge	QTc	--	--	D	12	12/20/1949	22.5	127	--	--	--	--	Irrigation, public supply	--
126	7/9-18J1	KJu	KJu	--	--	D	10	8/8/1951	13.6	--	--	--	--	--	Unused	--
127	7/8-18M1	QTge	QTc	--	--	D, G	12	4/29/1952	0.99	--	--	--	--	--	Irrigation	--
128	7/9-13M1	--	--	blue clay	Clay	D	12-8	10/5/1949	26.02	200	--	40	13	--	Irrigation, dairy	--
129	7/8-14M1	QTge	QTc	--	--	D	10	6/20/1951	22.98	--	--	--	--	--	Unused	--
130	7/8-13J1B	--	--	--	Sand (or sandstone) and gravel	--	--	--	--	--	--	50	61	--	--	--
131	7/8-18K1	QTge(?)	QTc	sand and gravel	D, G	10	5/25/1950	8	--	--	--	100	15	--	Irrigation	--
132	7/9-18K1	KJu	KJu	(reported "dry hole")	No data	D, G	6	8/8/1951	7.1	--	--	--	--	--	Unused	--
133	7/9-16L1	QTm	Twg	--	--	D	8-6	2/9/1950	65	--	--	3	10	--	Domestic	--
134	7/8-13J2	Tsv (?)	Tv	--	--	D	--	5/27/1947	7	--	--	60	30	--	Irrigation	--
135	7/8-18Q1	--	--	--	--	D	12	1/1/1941	--	--	--	--	--	--	Irrigation	--
136	7/8-13K1	QTge	QTc	--	--	D	12	4/20/1950	6.77	--	--	--	--	Warm	Irrigation	--
137	7/9-15Q1	--	--	--	--	D	8	approx. 1920	--	--	--	--	--	--	domestic	--
138	7/9-14K1	QTge	QTc	sand	Sand	D, G	16-12	10/18/1949	18.6	625	--	750	53	--	Irrigation	--
139	7/7-18L1	Qyal, Qaoal (?), QTge	Qal, QTc	clay, yellow, and gravel	Clay and gravel	D	12	9/1/1947	31	550	--	100	16	--	Irrigation	--
140	7/9-16Q1A	--	--	--	--	D	8	--	--	--	--	20	22	--	Industrial	--
141	7/9-16Q1B	--	--	--	--	D	12	5/1/1948	3	350	--	355	178	--	--	--
142	7/9-13R1	--	--	--	--	D	12	--	--	--	--	355	178	--	Irrigation	--

**Appendix 2. Hydrologic data.—Continued**

[Site IDs and well number correspond to locations in Appendix 1; leaders (--) not reported]

Site ID	Well number	Reported geologic unit present in water interval <sup>1</sup>	Simplified geologic unit present in water interval <sup>2</sup>	Reported lithology in water-bearing interval <sup>3</sup>	Interpreted lithologic class in water-bearing interval <sup>4</sup>	Well type <sup>5</sup>	Casing diameter, in inches <sup>6</sup>	Date Water level Measured <sup>7</sup>	Water level distance below land surface datum, in ft	Discharge, in gal/min	Pump test duration, in hours	Bailing or pumping rate, in gal/min <sup>8</sup>	Drawdown, in ft <sup>9</sup>	Temperature, in °F	Use	Comment	
143	7/8-17N1	Qyal	Qal	soft sandstone, gravel	Sand (or sandstone) and gravel	D	12	11/30/1949	13.75	--	--	--	--	--	Irrigation	--	
144	7/9-21B1	--	--	--	--	D	8-7	1/1/1944	--	--	--	--	--	--	Abandoned	--	
145	7/7-18R2	Tsv	Tv	volcanic rock, soft	Ash or tuff	D	12	10/1/1949	78	--	--	700	--	--	Irrigation	--	
146	7/8-24A2	Qyal, QTge, Tsv (?)	Qal, QTc	--	--	D	14-5.75	5/26/1949	159	--	--	--	--	84.0	Public supply	--	
147	7/7-18N1	--	--	--	--	D	--	1/1/1946	--	230	--	--	--	--	Irrigation, public supply	--	
148	7/8-21C1	--	--	--	--	D	8	1/1/1951	--	--	--	--	--	--	Industrial	--	
149	7/8-20C1	--	--	--	--	D	12-10	11/30/1949	14.89	--	--	320	73	--	Irrigation	--	
150	7/9-21C1	--	--	--	--	D	8	1/1/1944	--	--	--	--	--	--	Domestic	--	
151	7/8-24A3	--	--	--	--	D	12-10	1/1/1904	--	278	--	--	--	70.0	Public supply	--	
152	7/9-23F1	QTm	Twg	blue coarse sandstone	Sandstone	D	12-10-8	6/20/1951	78.3	325	--	400	85	73.0	Irrigation	--	
153	7/8-20D1	QTge	QTc	--	--	D, G	10	6/21/1950	12	--	--	100	20	--	Irrigation	--	
154	7/8-24A5	QTge	QTc	--	--	D	--	7/10/1949	105	382	--	--	--	66.0	Public supply	--	
155	7/8-24A6	Qyal (?), QTge, Tsv (?)	Qal, QTc	--	--	D, G	30-16	7/3/1950	59	--	--	1994	138.5	--	Public supply	--	
156	7/7-14A1	Tsv	Tv	rock, soft, brown	Ash or tuff	D	12	7/5/1950	73.25	--	--	--	--	--	Irrigation, public supply	--	
157	7/7-23A1	QTge	QTc	clay and boulders	Clay and gravel	D	8	11/3/1944	25	10 to 15	--	27	170	--	Irrigation	--	
158	7/8-24A4	QTge (?), QTm	QTc, Twg	sand solidified	Sandstone	D	16-10	5/26/1949	240	1004	--	--	--	86.0	Public supply	--	
159	7/7-24A1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
160	7/9-21G2	--	--	--	--	D	8	1/1/1947	--	--	--	--	--	--	Domestic	--	
161	7/7-23A2	Qyal, QTge	QTc	clay, yellow, and gravel	Clay and gravel	D	8	5/1/1948	6	6 to 8	--	32	207	--	Irrigation	--	
162	7/9-22F1	QTm	Twg	fine sand	Sand	D, G	10	8/30/1951	70.4	--	--	666	120	--	Irrigation	--	
163	7/9-22F2	QTm	Twg	(No perforations)	No data	D	10	8/30/1951	53.78	--	--	--	--	--	Domestic	--	
164	7/9-21F1	QTm	Twg	--	--	D	9-5-3	5/1/1942	48	--	--	22	75	64.0	Domestic, irrigation	--	
165	7/9-21G3	--	--	--	--	D	8-5	8/6/1946	62	--	--	8	40	--	Domestic, stock	--	
166	7/7-23G1	Qyal, Qaoal (?), QTge	Qal, QTc	clay, yellow sand, yellow	Clay	D	12.5	6/22/1950	6.25	--	--	--	--	--	Unused	--	
167	7/9-21G1	QTm	Twg	Sand	Sand	D	8	2/1/1942	88	6	--	4	52	--	Domestic	--	
168	7/9-21J1	--	--	--	--	D	7	--	--	--	--	--	--	--	Domestic	--	
169	7/9-23K1	QTge, QTm	QTc, Twg	--	--	D	--	11/28/1941	27	--	--	300	--	--	Domestic, irrigation	--	
170	7/9-24L2	QTge, QTm (?)	QTc, Twg	--	--	D, G	10	4/18/1951	33.3	--	--	350	35	--	Irrigation	--	
171	7/8-23L1	QTge	QTc	--	--	D	10-8	7/9/1947	79.2	--	--	--	--	66.0	Industrial	--	
172	7/8-24K1	--	--	--	--	D	8-6	12/19/1950	60	--	--	8	160	--	Domestic	--	
173	7/8-23M3	--	--	--	--	D	10	11/21/1949	27.8	--	--	--	--	--	Unused	--	
174	7/8-22K1	QTge	QTc	--	--	D	12	1/23/1950	14.99	125	--	--	--	--	Irrigation	--	
175	7/8-23M4	Qyal, Qaoal (?), QTge	Qal, QTc	gravel	Gravel	D	14	6/5/1951	52.12	--	--	--	--	--	Unused	--	
176	7/8-19P1	QTge	QTc	sand; gravel	Sand (or sandstone) and gravel	D	8	11/30/1949	21.56	--	--	94	39	--	--	--	--
177	7/8-20K1	QTge	QTc	yellow clay	Clay	D	12	10/4/1949	20.4	450	--	--	--	--	Irrigation	--	
178	7/9-24J1	--	--	--	--	D	--	--	--	--	--	--	--	--	--	--	
179	7/8-22R2	--	--	--	--	D	12	1/23/1950	4.1	90	--	--	--	--	Irrigation	--	
180	7/8-23M1	QTm (?), QTge (?)	QTc, Twg	clay, yellow, sandy	Clay and sand (or sandstone)	D, G	12-10	10/11/1949	190	--	24	295	201.7	--	--	--	--
181	7/8-22Q1	--	--	--	--	D	12	1/1/1925	--	125	--	--	--	--	Irrigation	--	
182	7/9-30A1	QTm	Twg	--	--	D	12	4/12/1944	10	--	--	75	--	--	Domestic	--	
183	7/8-23P1	--	--	--	--	D	8	4/1/1940	16	--	--	43	40	--	Industrial	--	
184	7/6-19R1	--	--	--	--	D	8	1/1/1950	--	100	--	--	80	--	Irrigation	--	
185	7/6-19N1	Qyal, QTge (?)	QTc	brown silt	Sand and clay	D	10	3/29/1951	5	7	--	--	80	--	Domestic	--	
186	7/9-25A1A	--	--	--	--	D	--	2/2/1950	9.15	--	--	50	30	--	Domestic, dairy	--	
187	7/9-25A1B	--	--	--	--	D	8	4/18/1951	7.34	--	--	100	30	--	--	--	
188	7/9-30G2	QTm	Twg	(cased to 114 ft.)	No data	D	12	7/6/1950	35.87	--	--	--	--	--	Unused	--	
189	7/7-29D1	Qyal, QTge (?)	QTc	loose gravel	Gravel	D, G	8	4/18/1950	46.55	--	--	--	--	--	Irrigation	--	
190	7/9-27E2	--	--	--	--	D, G	8	5/1/1951	9	--	--	300	100	--	Industrial	--	
191	7/9-27F1	QTm	Twg	--	--	D	8	6/23/1950	10.62	--	--	100	--	--	Industrial	--	
192	7/7-30C1	QTge, QTm (?)	QTc, Twg	boulders, hard	Gravel	D, G	8	7/23/1951	55	--	--	200	120	--	Public supply	--	
193	7/9-28G1	--	--	--	--	D	8	4/13/1950	2	5	--	40	--	--	Industrial	--	

**Appendix 2. Hydrologic data.—Continued**

[Site IDs and well number correspond to locations in Appendix 1; leaders (--), not reported]

Site ID	Well number	Reported geologic unit present in water interval <sup>1</sup>	Simplified geologic unit present in water interval <sup>2</sup>	Reported lithology in water-bearing interval <sup>3</sup>	Interpreted lithologic class in water-bearing interval <sup>4</sup>	Well type <sup>5</sup>	Casing diameter, in inches <sup>6</sup>	Date Water level Measured <sup>7</sup>	Water level distance below land surface datum, in ft	Discharge, in gal/min	Pump test duration, in hours	Bailing or pumping rate, in gal/min <sup>8</sup>	Drawdown, in ft <sup>9</sup>	Temperature, in °F	Use	Comment
194	7/9-28G2	--	--	--	--	D	8	4/17/1951	4	--	--	--	--	--	Industrial	--
195	7/9-27E1	--	--	--	--	D	8	--	--	--	--	--	--	--	Industrial	--
196	7/9-30J1	--	--	--	--	D	8	1/1/1948	--	--	--	--	--	--	--	--
197	7/9-26M1	QTm	Twg	--	--	D	8	4/12/1950	19.93	17	--	--	--	--	Domestic, stock	--
198	7/8-28F1	QTge	QTc	hardpan sandstone (20 ft of surface casing)	Clay and gravel	D	8	12/19/1949	9.03	--	--	25	23	--	Domestic	--
199	7/9-28L1	QTm	Twg	Sandstone	D	12	8/30/1951	130.8	--	--	--	--	--	70.0	Irrigation	--
200	7/9-29J1	QTm	Twg	uncased below 60 ft	No data	D	12	7/6/1950	55.95	300	--	--	--	--	Domestic, dairy, irrigation, stock	--
201	7/8-25L1	--	--	--	--	D, G	8	6/5/1951	10.65	--	100	745	--	--	Unused	--
202	7/8-29R1	--	--	--	--	D	12-10	10/4/1949	20.86	480	--	450	90	--	Public supply	--
203	7/8-29R2	--	--	blue sandstone with occasional hard streaks of	--	D	12	1/1/1943	--	--	--	--	--	--	Abandoned	--
204	7/9-29J2	QTm	Twg	hard gray sandstone	Sandstone	D	12	8/30/1951	118.5	200	--	--	--	70.0	Irrigation	--
205	7/9-28P1	QTm	Twg	Uncased below 100 ft	No data	D	12	4/17/1951	2	30	--	400	150	69.0	Irrigation	--
206	7/8-29J1	QTge	QTc	clay, blue, some gravel	Clay and gravel	D, G	12-10	10/4/1949	22.14	450	--	450	192	--	Public supply	--
207	7/8-25R1	--	--	--	--	D	8	1/1/1947	--	--	--	--	--	--	Domestic	--
208	7/9-33D2	QTm	Twg	--	--	D	12	4/17/1951	18.2	--	--	--	--	61.0	Irrigation	--
209	7/9-33A1	QTm	Twg	--	--	D	7	4/13/1950	36	--	--	--	--	--	Unused	--
210	7/9-31A1	QTm	Twg	cemented gravel, first	--	D	8-6	2/1/1956	85	--	--	13	85	--	Domestic	--
211	7/8-36D2	Qyal, QTge	QTc	water at 77 feet	Gravel	D	8	6/24/1946	42	--	--	42	8	--	Domestic	--
212	7/8-30P1	QTge	QTc	hardpan	Clay and gravel	D	8	12/21/1949	10.45	--	--	160	33	--	Irrigation, stock	--
213	7/8-31C1	QTge	QTc	--	--	D	12-10	8/11/1950	14.4	250	--	--	--	--	Unused	--
214	7/8-35H1	QTge	QTc	--	--	D	12-18	1/1/1946	42	--	--	33	24	--	Domestic, irrigation, stock	--
215	7/9-34G1	--	--	--	--	D	8-6	4/11/1951	40	--	--	26	30	--	Domestic	--
216	7/9-32F2	--	--	--	--	D	8-6	1/1/1946	--	7	--	--	--	--	Domestic	--
217	7/9-33F1	QTm	Twg	sand, sandstone	Sandstone	D	8	4/13/1950	3.7	--	--	--	--	--	Domestic, irrigation	--
218	7/9-35E1	QTm	Twg	--	--	D	8	4/12/1950	59	--	--	--	--	--	Domestic	--
219	7/9-32E1	QTm	Twg	(Uncased below 6 ft.)	No data	D	8	7/1/1945	180	--	--	--	--	--	Domestic	--
220	7/9-36H1	QTge	QTc	yellow clay	Clay	D, G	12	7/14/1950	15	--	--	100	40	--	Irrigation	--
221	7/6-32F1	Qyal, QTge	QTc	tule mud	Clay and sand (or sandstone)	D	12	10/27/1950	2.6	--	--	180	67	--	Irrigation, unused	--
222	7/9-34L1	--	--	--	--	D	8-6	4/13/1950	28.32	--	--	--	--	--	Domestic, irrigation	--
223	7/9-36F1	QTge	QTc	clay and mixed gravel	Clay and gravel	D,	10	10/4/1949	31.35	460	--	550	26	--	Irrigation	--
224	7/9-31J1	--	--	--	--	D,	6	1/1/1950	--	--	--	10	100	--	Domestic	--
225	7/9-34J1	QTm	Twg	(cased to 204 ft)	No data	D	8	6/23/1950	53.1	--	--	--	--	--	Domestic, industrial	--
226	7/7-32G1	Qyal	Qal	gravel	Gravel	D, G	12-8	4/18/1959	4	150	--	--	--	74.0	Irrigation	--
227	7/9-34J2	--	--	--	--	D	8	7/25/1946	39	--	--	20	50	--	Public supply	--
228	7/8-33M1	QTge	QTc	clay	Clay	D, G	10	11/2/1950	20	--	--	500	195	--	Public supply	--
229	7/9-31Q1	--	--	--	--	D	7	4/1/1944	70	--	--	8	--	--	Domestic	--
230	7/9-36M1	QTge	QTc	clay, blue	Clay	D	8	8/1/1937	11	--	--	33	34	--	Industrial	--
231	7/9-31Q3	QTm	Twg	(Uncased below 8 ft.)	No data	D	8	9/21/1949	145	--	--	5	205	--	Domestic	--
232	7/9-35R1	QTm	Twg	soil	Sand and clay	D	10	4/12/1950	0.05	--	--	--	--	--	Unused	--
233	6/9-3A1	--	--	--	--	D	8	1/1/1946	--	--	--	17	--	--	Domestic	--
234	6/9-2C1	QTm	Twg	sandstone	Sandstone	D	12	4/16/1951	70.72	--	--	--	--	--	Public supply	--
235	6/8-5E1	QTge	QTc	coarse, brown sand volcanic conglomerate	Sand	D, G	12-8	5/22/1951	10	--	--	600	140	67.0	Irrigation	--
236	6/6-4J1	Tsv	Tv	formation	Ash or tuff	D	10	6/6/1949	7	--	--	280	80	72.0	Domestic, irrigation, stock	--
237	6/7-3Q1	QTge	QTc	clay	Clay	D, G	12-10	4/19/1950	55	--	--	1200, 1500	55	--	Irrigation	--
238	6/8-7D1	--	--	--	--	D	12	1/1/1949	--	--	--	--	--	--	Irrigation	--

**Appendix 2. Hydrologic data.—Continued**

[Site IDs and well number correspond to locations in Appendix 1; leaders (--), not reported]

Site ID	Well number	Reported geologic unit present in water interval <sup>1</sup>	Simplified geologic unit present in water interval <sup>2</sup>	Reported lithology in water-bearing interval <sup>3</sup>	Interpreted lithologic class in water-bearing interval <sup>4</sup>	Well type <sup>5</sup>	Casing diameter, in inches <sup>6</sup>	Date Water level Measured <sup>7</sup>	Water level distance below land surface datum, in ft	Discharge, in gal/min	Pump test duration, in hours	Bailing or pumping rate, in gal/min <sup>8</sup>	Drawdown, in ft <sup>9</sup>	Temperature, in °F	Use	Comment
239	6/8-12J1	QTge	QTc	sandy, yellow clay	Clay and sand (or sandstone)	D	8	6/1/1939	20	--	--	30	40	--	Domestic	--
240	6/6-8N1	QTge	QTc	boulders	Gravel	D	12	7/26/1950	98.45	--	--	--	--	--	Irrigation	--
241	6/6-17A1	QTge	QTc	dirt and boulders	Sand (or sandstone) and gravel	D	8	6/30/1949	18	--	--	10	72	--	Domestic	--
242	6/8-17K1	QTm	Twg	sand, yellow, and gravel	Sand (or sandstone) and gravel	D	10	2/9/1950	49.65	--	--	--	--	--	Dairy, irrigation	--
243	6/8-16R1A	QTm (?)	Twg	sandy yellow clay	Clay and sand (or sandstone)	D	12	6/14/1950	130	--	--	315	152	--	Irrigation	--
244	6/9-22A1	QTm	Twg	topsoil, sandy loam	Sand and clay	D	10	6/6/1951	1.4	5.5	--	85	200	--	Irrigation	--
245	6/7-19D1	QTge	QTc	clay, blue	Clay	D	8	6/1/1949	9	--	--	75	45	--	Irrigation	--
246	6/8-23C1	--	--	--	Sand (or sandstone) and gravel	D	--	1/1/1931	--	--	--	--	--	--	Abandoned	--
247	6/8-22N1	QTm	Twg	sand and gravel	Sand and gravel	D	8-7	3/1/1942	25	--	--	38	33	--	Domestic	--
248	6/7-29P1	Tsv	Tv	rock	Ash or tuff	D	10	8/3/1944	2.5	--	--	51	12.5	--	Domestic	--
249	6/8-35A2	Qtal	Qal	clay, yellow	Clay	D	12	12/9/1949	8.33	--	--	--	--	--	Public supply	--
250	6/8-36A1	Qyal, QTm	Qal, Twg	clay, yellow, and gravel; mixed	Clay and gravel	D	14-12	11/1/1935	8	600	--	375	137	--	Irrigation	--
251	6/7-31H1	Qyal, QTge	QTc	clay, yellow, and gravel	Clay and gravel	D	8	11/29/1949	40.44	80	--	--	--	--	Domestic, irrigation, stock	--
252	6/7-31G1	QTge	QTc	clay, yellow, and gravel	Clay and gravel	D	12	11/29/1949	21.62	--	--	75	60	--	Irrigation	--
253	6/8-33E1	Tp	Tp	clay, sandy, yellow	Clay and sand (or sandstone)	D	8	6/1/1945	12	--	--	5	68	--	Domestic, stock	--
254	6/7-31L1	Qyal, QTge	QTc	clay, yellow, and gravel	Clay and gravel	D	8	6/1/1948	13	--	--	20	54	--	Stock	--
255	6/7-32M1	Qyal, QTge	QTc	clay, yellow, and gravel	Clay and gravel	D	12	11/22/1949	24.49	--	--	70	200	--	Unused	--
256	6/7-31J1	Qyal, QTge	QTc	yellow clay	Clay	D	12	11/30/1949	27.01	125	--	--	--	--	Irrigation	--
257	5/7-6E1	Qyal, QTm	Qal, Twg	sand, yellow; and gravel; water	Sand	D	8	6/1/1949	37	20	--	23	26	--	Domestic, stock	--
258	5/8-1H1	Qyal, QTm	Qal, Twg	clay, blue	Clay	D	8	12/8/1949	126.56	--	--	--	--	--	Domestic, public supply	--
259	5/7-5K1	QTm, Tp	Twg, Tp	clay, blue	Clay	D	8	4/1/1947	128	17	--	17	51	--	Domestic	--
260	5/8-1J1	QTm	Twg	clay, blue	Clay	D	8	2/16/1950	33.97	30	--	18	120	--	Domestic	--
261	5/8-1L1	QTm	Twg	clay, blue	Clay	D	8	10/1/1945	70	--	--	5	30	--	Domestic	--
262	5/8-13B1	Qyal, QTm	Qal, Twg	sand; first water at 22 feet	Sand	D	8	8/7/1940	12	--	--	25	36	--	Stock	--
263	5/7-15K1	Tp	Tp	yellow clay	Clay	D	--	11/1/1939	34	--	--	40	31	--	Domestic	--
264	5/7-20C1	Qyal, Qoal (?)	Qal	clay	Clay	D, G	12-8	10/14/1949	8.04	--	--	650	140	--	Irrigation, stock	--
265	5/7-19N1	QTm	Twg	sand	Sand	D	8	3/1/1950	4.37	--	--	18	37	--	Domestic, dairy, stock	--
266	5/7-25A1	Tp	Tp	--	--	D	10-6	11/1/1949	126.18	--	--	3	12	--	Domestic, stock	--
267	5/7-25C1	Tp	Tp	blue clay	Clay	D	8	4/5/1951	123	--	--	--	--	--	Public supply	--
268	5/7-28A3	Qyal, Qoal	Qal	clay, yellow, and gravel	Clay and gravel	D	14	4/5/1951	15.79	--	--	44	117	--	Public supply	--
269	5/7-28H5	--	--	--	--	D	14	--	--	--	--	132	62	--	Public supply	--
270	5/7-28H1	Qyal, Qoal	Qal	clay, sandy, yellow	Clay and sand (or sandstone)	D	12-10	4/5/1951	21.5	--	--	--	--	--	Public supply	--
271	5/7-26R1	Qyal, Qoal	Qal	sandy, coarse, and gravel sand, coarse streaks in yellow clay	Sand (or sandstone) and gravel	D, G	28-12	2/2/1950	32.93	--	--	300	140	--	Unused	--
272	5/7-35H1	Qyal, Qoal (?)	Qal	clay, blue, and gravel	Sand and clay	D	28-12	6/30/1948	75	--	--	--	--	--	Public supply	--
273	5/7-33M1	QTm	Twg	sand and clay, yellow	Clay and gravel	D	8	10/25/1947	40	--	--	37	6	--	Unused	--
274	5/7-33Q1	Qyal	Qal	clay, sand, and gravel	Clay	D	10-8	3/24/1950	19.37	--	--	55	140	--	Irrigation	--
275	5/7-32R1	Tsv	Tv	rock, decomposed, yellow	Sandstone	D	--	11/22/1949	25.6	--	--	110	92	--	Public supply	--
276	4/6-27L1	Qyal, Qoal, Qoal (?), QTge	Qal, QTc	--	--	D	10-8	2/22/1950	0.13	10	--	16	--	--	Unused	--
277	6/6-10F1	QTge	QTc	hardpan and boulders	Clay and gravel	DR	6	6/1/1947	31	--	--	300	119	67.0	Domestic	--
278	6/6-16J2	QTge	QTc	dirt, gravel and clay, yellow-mixture	Clay, sand, and gravel	DR	6	5/1/1947	Flowing	3	--	500 gph	70	--	Domestic	--

**Appendix 2. Hydrologic data.—Continued**

[Site IDs and well number correspond to locations in Appendix 1; leaders (--), not reported]

Site ID	Well number	Reported geologic unit present in water interval <sup>1</sup>	Simplified geologic unit present in water interval <sup>2</sup>	Reported lithology in water-bearing interval <sup>3</sup>	Interpreted lithologic class in water-bearing interval <sup>4</sup>	Well type <sup>5</sup>	Casing diameter, in inches <sup>6</sup>	Date Water level Measured <sup>7</sup>	Water level distance below land surface datum, in ft	Discharge, in gal/min	Pump test duration, in hours	Bailing or pumping rate, in gal/min <sup>8</sup>	Drawdown, in ft <sup>9</sup>	Temperature, in °F	Use	Comment
279	6/6-22R3	--	--	--	--	DR	8	1/1/1946	--	--	--	--	--	--	Domestic, irrigation	--
280	6/6-26E1	Qoal, QTge	Qal, QTc	soil	Sand and clay	DR	10	10/1/1948	4	--	--	100	96	--	Domestic	--
281	6/6-34C1	QTge	QTc	clay, yellow	Clay	DR	10	7/3/1951	14.84	--	--	--	--	--	Irrigation	--
282	5/5-8B1	Qoal	Qal	dirt and gravel	Clay, sand, and gravel	DR	6	2/1/1942	22	--	--	150 gph	48	--	Domestic	--
283	5/5-8A1	Qoal	Qal	boulder and clay	Clay and gravel	DR	6	9/1/1946	17	--	--	700 gph	83	--	Domestic, irrigation	--
284	5/5-7A1	--	--	--	--	DR	12	--	--	--	--	--	--	--	Domestic, industrial	--
285	5/5-8E1	--	--	--	--	DR	12	1/1/1946	--	--	--	--	--	--	Domestic, industrial	--
286	5/5-9M1	Qoal	Qal	"hardpan"	Clay and gravel	DR	6	1/1/1949	27	--	--	800 gph	27	--	Domestic	--
287	5/6-10K1	Qoal	Qal	"hardpan" and boulders	Clay and gravel	DR	8	12/1/1949	28	--	--	900 gph	112	--	Domestic	--
288	5/5-9N2	Qoal, Qh	Qal, QTc	soil	Sand and clay	DR	6	11/1/1947	Flowing	--	--	800 gph	90	--	Domestic	--
289	5/5-8P1	Qoal	Qal	clay, yellow, and gravel	Clay and gravel	DR	8	6/1/1947	12	--	--	3,000 gph	88	--	Domestic	--
290	5/5-17B1	Qoal	Qal	hardpan and clay	Clay and gravel	DR	12	1/4/1952	6.07	--	--	--	--	--	Irrigation	--
291	5/5-17C4	Qh	QTc	clay, yellow	Clay	--	--	8/15/1951	59	--	--	20	39	--	Irrigation	--
292	5/6-14B2	Qyal	Qal	bearing	Gravel	DR	12	4/1/1947	22	--	--	365	88	--	Irrigation	--
293	5/5-16E1	Qoal, Qh	Qal, QTc	rock	Gravel	DR	8	6/1/1948	21	--	--	1,100 gph	129	--	Irrigation	--
294	5/6-13F1	Qyal, Qoal	Qal	clay	Clay	DR	14	12/1/1949	17	--	--	500	46	--	Irrigation	--
295	5/6-13F2	Qyal, Qoal	Qal	clay	Clay	DR	14	12/1/1949	18	--	--	400	57	--	Irrigation	--
296	5/5-17J1	Qoal	Qal	clay, sandy dirt, gravel and clay, yellow-	Clay and sand (or sandstone)	--	--	9/1/1945	14	--	--	975 gph	66	--	Domestic	--
297	5/5-18K1	Qoal	Qal	mixture	Clay, sand, and gravel	DR	8	8/1/1947	17	--	--	900 gph	73	--	Domestic	--
298	5/5-17N1	--	--	--	--	DR	8	1/1/1930	--	--	--	--	--	--	Domestic	--
299	5/5-17R2	Qoal, Qh	Qal, QTc	clay, gray	Clay	DR	6	5/1/1948	10	--	--	100 gph	60	--	Domestic	--
300	5/5-21E1	Qh	QTc	clay, blue	Clay	DR	8	4/6/1950	4.6	--	--	--	--	--	Irrigation	--
301	5/6-24K1	Qyal, Qoal	Qal	gravel.	Gravel	DR	--	5/17/1950	8.61	--	--	--	--	--	Irrigation	--
302	5/5-22L1	Qh	QTc	soil	Sand and clay	DR	8	3/1/1950	Flowing	--	--	--	--	--	Domestic	--
303	5/5-19L5	Qoal	Qal	hardpan and sand	Clay and gravel	DR	6	10/1/1942	21	--	--	950 gph	--	--	Domestic	--
304	5/5-22L2	Qh	QTc	soil	Sand and clay	--	--	3/31/1950	Flowing	--	--	--	--	--	Irrigation	--
305	5/5-19L1	Qoal, Qh (?)	Qal, QTc	hardpan and clay	Clay and gravel	DR	12	11/1/1948	10	--	--	450	80	--	Irrigation	--
306	5/5-22Q1	Qh	QTc	soil	Sand and clay	DR	12	4/5/1950	Flowing	--	--	--	--	--	Irrigation	--
307	5/5-20R1	Qoal	Qal	sand and dirt	Sand and clay	DR	8	3/28/1950	2.48	--	--	350 gph	--	--	Domestic	Reported to flow when drilled
308	5/5-21R1	Qoal	Qal	clay, sandy	Clay and sand (or sandstone)	DR	8	11/1/1948	30	--	--	--	--	--	Domestic	--
309	5/5-30E1	--	--	soil	Sand and clay	DR	12	2/1/1951	Flowing	--	--	300	--	--	Irrigation	--
310	5/5-27H1	Qh	QTc	soil	Sand and clay	DR	12	1/26/1950	Flowing	--	--	--	80.5	--	Dairy	--
311	6/6-9R1	QTge	QTc	water at 70 feet	Clay and gravel	D	8	12/1/1947	46	--	--	30	34	--	Domestic	--
312	6/6-16B1	QTge	QTc	clay and rock	Clay and gravel	D	5	10/30/1941	40	--	--	7	210	73.0	Domestic	--
313	5/6-25P1	Qoal	Qal	soil	Sand and clay	DR	8	10/5/1946	Flowing	--	--	600 gph	--	--	Domestic	--
314	5/5-31A1	Qyal (?)	Qal	--	--	DR	8	9/1/1927	Flowing	--	--	--	--	--	Domestic, stock	--
315	5/5-31H1	Qyal (?)	Qal	"muck," blue	Clay and sand (or sandstone)	DR	6	10/1/1948	9	--	--	450 gph	116	--	Domestic	--
316	4/5-3C1	--	--	--	--	DR	7	1/1/1945	--	--	--	--	--	--	Irrigation	--
317	4/5-14D2	--	--	peat and silt	Clay and sand (or sandstone)	--	--	9/13/1951	23	--	--	395	140	--	Public supply	--
318	4/5-14D1	--	--	clay blue	Clay	DR	--	3/16/1950	10.96	--	--	43	61	--	Public supply	--
319	4/5-14L1	--	--	dark "surface" mud and peat	Clay and sand (or sandstone)	DR	--	3/16/1950	1.35	--	--	--	--	--	Public supply	--
320	9/7-26C1	--	--	--	--	--	--	1/1/1935	--	--	--	--	--	--	Abandoned	Well destroyed

**Appendix 2. Hydrologic data.—Continued**

[Site IDs and well number correspond to locations in Appendix 1; leaders (--), not reported]

Site ID	Well number	Reported geologic unit present in water interval <sup>1</sup>	Simplified geologic unit present in water interval <sup>2</sup>	Reported lithology in water-bearing interval <sup>3</sup>	Interpreted lithologic class in water-bearing interval <sup>4</sup>	Well type <sup>5</sup>	Casing diameter, in inches <sup>6</sup>	Date Water level Measured <sup>7</sup>	Water level distance below land surface datum, in ft	Discharge, in gal/min	Pump test duration, in hours	Bailing or pumping rate, in gal/min <sup>8</sup>	Drawdown, in ft <sup>9</sup>	Temperature, in °F	Use	Comment
321	9/7-26G1	Qyal	Qal	surface soil	Sand and clay	DR	12	10/6/1949	Flowing	--	--	--	--	89.0	Unused	--
322	8/6-14R1	Qyal	Qal	clay and boulders	Sand and clay	DR	8	11/28/1949	8.28	--	--	--	--	65.0	Domestic	--
323	8/6-23M1	Qyal, Qaoal	Qal	clay, boulders; some water at 15 ft.	Clay and gravel	DR	8	10/13/1949	58.63	--	--	1	--	--	Domestic	--
324	7/5-15A1	Qyal, Qaoal	Qal	clay, yellow	Clay and gravel	DR	10	3/28/1934	10	--	--	300	--	71.0	Irrigation	--
325	7/5-14G1	Qyal, Qaoal	Qal		Clay	DR	--	11/9/1949	11.26	--	--	--	--	68.5	Irrigation	--
326	7/5-16L1	Qyal, Qaoal	Qal	clay, yellow; and boulders	Clay and gravel	DR	8	10/4/1949	35	--	--	36	--	--	Domestic	--
327	7/5-17J1	Tsv	Tv	rock, broken, water	Ash or tuff	DR	--	10/4/1949	60.7	--	--	--	--	--	irrigation	--
328	7/5-16N1	Qyal, Qaoal	Qal	clay and boulders	Clay and gravel	DR	--	10/4/1949	59	--	--	--	--	--	Domestic	--
329	7/5-23L1	Qyal, Qaoal	Qal	soil	Sand and clay	DR	--	10/14/1949	7.66	--	--	--	--	--	Irrigation	--
330	7/5-27D1	--	--	--	--	DR	8	1/1/1929	--	--	--	--	--	--	Abandoned	--
331	7/4-30L1	--	--	--	--	DR	8	12/20/1949	--	--	--	--	--	62.0	--	--
332	7/4-31E1	Qyal, Qaoal	Qal	clay	Clay	DR	12	9/30/1949	9.26	--	--	--	--	--	Unused	--
333	7/5-36N1	Qoal	Qal	clay, brown	Clay	DR	8	10/13/1949	4.17	--	--	15	6	--	Domestic,	--
334	6/5-1C3	Qoal	Qal	clay, boulders, yellow	Clay and gravel	DR	8	12/2/1949	20.9	--	--	--	--	60.0	Domestic	--
335	6/4-5A1	Qyal, Qaoal	Qal	hardpan and clay	Clay and gravel	DR	16	12/16/1949	7.23	--	--	--	--	--	Domestic	--
336	6/4-5B1	--	--	--	--	DR	--	1/1/1916	--	--	--	--	--	--	Abandoned	--
337	6/4-5B2	--	--	--	--	DR	--	1/1/1916	--	--	--	--	--	--	Abandoned	--
338	6/4-4E1	Qyal	Qal	clay, yellow and boulders	Clay and gravel	DR	16	12/6/1949	12.04	--	--	--	--	--	Unused	Reported to be a dry hole
339	6/4-5J1	--	--	--	--	DR	--	1/1/1916	--	--	--	--	--	--	Abandoned	Well destroyed
340	6/4-6R1	Qyal	Qal	clay, yellow	Clay	DR	26	7/27/1948	32	--	--	15	15	--	Domestic, dairy, stock	--
341	6/4-6R2	Qyal, Qaoal	Qal	clay, yellow	Clay	DR	12	12/6/1950	16.9	--	--	400	--	--	Domestic, dairy, irrigation, stock	--
342	6/4-6P1	Qyal, Qaoal	Qal	topsoil	Sand and clay	DR	12	12/1/1949	12	--	--	400	26	63.0	Irrigation	--
343	6/4-5Q1	Qyal, Qaoal	Qal	soil	Sand and clay	DR	--	12/6/1949	8.38	--	--	--	--	--	Unused	--
344	6/4-17A1	Qyal, Qaoal	Qal	clay, yellow, and gravel	Clay and gravel	DR	12	10/19/1949	16.62	--	--	250	--	--	Irrigation	--
345	6/4-18A3	Qyal	Qal	clay	Clay	DR	12	3/27/1952	12.15	--	--	--	--	66.5	Irrigation	--
346	6/4-15Q1	Qoal	Qal	clay and boulders	Clay and gravel	DR	8	10/13/1949	27	--	--	--	--	68.0	Domestic, stock	--
347	6/4-15Q3	Qoal, Qh (?)	Qal, QTc	clay, and boulders	Clay and gravel	DR	8	5/22/1948	12	--	--	--	--	--	Domestic	--
348	6/4-22B3	--	--	--	--	DR	8	1/1/1948	--	--	--	--	--	--	Domestic	--
349	6/4-22B2	--	--	--	--	DR	8	1/1/1948	--	--	--	--	--	--	Domestic	--
350	6/4-19B1	Qyal, Qaoal (?)	Qal	clay and boulders	Clay and gravel	DR	12	3/27/1952	20.68	--	--	--	--	--	--	--
351	6/4-23F1	Qh	QTc	rock, gray	Ash or tuff	DR	--	2/1/1950	39.94	--	--	20	--	--	Stock	Pump dry october 1949
352	6/3-19M1	Tsv	Tv	pumice	Ash or tuff	DR	8	4/25/1949	20	--	--	10	127	--	Domestic	--
353	6/4-23J1	Qh	QTc	soil	Sand and clay	DR	18	2/1/1950	Flowing	--	--	665	66	85.0	Irrigation	--
354	6/4-21Q1	Qyal	Qal	clay	Clay	DR	8	6/1/1918	13.4	--	--	--	--	--	Abandoned	Well destroyed
355	6/4-27C2	--	--	--	--	DR	--	1/1/1950	--	--	--	1/2	--	--	Abandoned	--
356	6/4-30C1	Qoal	Qal	clay	Clay	DR	8	1/1/1928	31	--	--	--	--	--	Domestic	--
357	6/4-25B1	Tsv	Tv	tuff, blue	Ash or tuff	DR	--	2/9/1950	45	--	--	--	--	--	--	--
358	6/4-25B2	--	--	--	--	DR	8	1/1/1946	--	--	--	--	--	--	--	--
359	6/4-25D1	Qh	QTc	sandstone, yellow, soft	Sandstone	DR	10	6/1/1918	Flowing	--	--	--	--	--	Public swimming pool	--
360	6/4-26H1	Qh	QTc	soil	Sand and clay	DR	--	3/23/1950	Flowing	--	--	--	--	75.0	Domestic	--
361	6/4-28F1	Qoal	Qal	clay, yellow	Clay	DR	8	2/8/1950	3.03	--	--	--	--	--	Domestic	--
362	6/4-26F1	--	--	--	--	DR	6	1/1/1944	--	--	--	--	--	--	Domestic	--
363	6/4-28K2	Qoal	Qal	clay, yellow	Clay	DR	8	7/1/1950	30	--	--	--	--	--	Domestic, stock	--
364	6/4-26L2	Qoal	Qal	clay	Clay	DR	6	2/1/1950	12.11	--	--	--	--	--	Domestic, irrigation	--
365	6/4-26L1	--	--	--	--	DR	6	1/1/1946	--	--	--	--	--	--	Domestic	--
366	6/4-27M1	--	--	--	--	DR	8	1/1/1948	--	--	--	--	--	--	Domestic	--
367	6/4-26N1	Qyal, Qaoal	Qal	clay	Clay	DR	8	1/12/1950	23.47	--	--	--	--	60.0	Domestic	--

**Appendix 2. Hydrologic data.—Continued**

[Site IDs and well number correspond to locations in Appendix 1; leaders (--), not reported]

Site ID	Well number	Reported geologic unit present in water interval <sup>1</sup>	Simplified geologic unit present in water interval <sup>2</sup>	Reported lithology in water-bearing interval <sup>3</sup>	Interpreted lithologic class in water-bearing interval <sup>4</sup>	Well type <sup>5</sup>	Casing diameter, in inches <sup>6</sup>	Date Water level Measured <sup>7</sup>	Water level distance below land surface datum, in ft	Discharge, in gal/min	Pump test duration, in hours	Bailing or pumping rate, in gal/min <sup>8</sup>	Drawdown, in ft <sup>9</sup>	Temperature, in °F	Use	Comment	
368	6/4-27N1	Qoal	Qal	--	--	DR	8	11/21/1949	24.12	--	--	--	--	--	Domestic, stock	--	
369	6/4-28Q1	Qoal	Qal	--	--	DR	--	1/1/1930	20	--	--	--	--	--	Unused	--	
370	6/4-34D2	Qoal	Qal	clay, yellow	Clay	DR	8	10/12/1949	13.72	--	--	--	--	--	Unused	--	
371	6/4-36C1	Qyal (?)	Qal	--	--	DR	10	4/1/1948	9.9	--	--	150	113	--	Irrigation	--	
372	6/4-35G2	--	--	--	--	DR	8	1/1/1948	--	--	--	--	--	--	Domestic	--	
373	6/4-35G3	Qoal	Qal	surface	Sand and clay	DR	6	1/31/1950	8.11	--	--	--	--	--	Domestic	--	
374	6/4-35G4	Qoal	Qal	surface	Sand and clay	DR	8	3/27/1952	2.64	--	--	50	30	--	Domestic, irrigation	--	
375	6/4-33L2	--	--	--	--	DR	8	1/1/1931	--	--	--	--	--	--	Domestic	--	
376	6/4-35L2	--	--	--	--	DR	8	1/12/1950	--	--	--	--	--	--	Domestic, stock	--	
377	6/4-36J1	--	--	boulders and conglomerate	Clay, sand, and gravel	DR	8	2/2/1950	41.85	--	--	--	--	--	Domestic	--	
378	6/4-36L1	--	--	--	clay, yellow, sand and gravel	DR	--	1/1/1948	--	--	--	--	--	63.0	Domestic	--	
379	6/4-32J1	Qyal, Qoal	Qal	gravel	Clay, sand, and gravel	DR	8	10/12/1949	43.68	--	--	--	--	--	Domestic	--	
380	6/4-33M1	Qyal, Qoal	Qal	clay, yellow	Clay	DR	8	10/12/1949	13.64	--	--	--	--	--	Unused	--	
381	6/4-35P2	Qyal, Qoal	Qal	sand loam	Clay and gravel	DR	8	6/15/1950	17.76	--	--	--	--	--	Irrigation	--	
382	6/4-32N1	KJu	KJu	shale, blue	Clay and sand (or sandstone)	DR	8	10/11/1949	49.03	--	--	--	--	--	Unused	--	
383	6/4-35Q1	--	--	--	--	DR	8	1/1/1937	--	--	--	50	--	--	Domestic, irrigation	--	
384	6/4-35R1	Tsv	Tv	volcanic rock, hard, red	Ash or tuff	DR	6	2/8/1950	150	--	--	10	--	--	Domestic	--	
385	5/4-2B1	--	--	--	--	DR	--	--	--	--	--	--	--	--	Domestic	--	
386	5/4-1G1	--	--	--	--	DR	8	1/1/1944	--	--	--	--	--	--	Domestic	--	
387	5/4-5H4	--	--	--	--	DR	--	1/1/1946	--	--	--	--	--	--	Domestic	--	
388	5/3-6M2	Tsv	Tv	rock, blue	Ash or tuff	DR	6	1/30/1950	48.52	--	--	--	--	--	Domestic	Water reported to have strong "sulfur" taste.	
389	5/3-6M1	--	--	--	--	DR	8	1/1/1930	--	--	--	--	--	--	Domestic, stock	--	
390	5/4-3M1	--	--	--	--	DR	--	--	--	--	--	--	--	--	Abandoned	--	
391	5/3-5M2	--	--	--	--	DR	8	1/1/1948	--	--	--	--	--	--	Domestic, irrigation	Water Reported to have high iron content.	
392	5/3-6J1	Tsv	Tv	diatomite	Clay and sand (or sandstone)	DR	10	5/22/1951	27.36	--	--	--	--	--	--	--	--
393	5/4-4K2	Qyal, Qoal	Qal	clay, yellow	Clay	DR	8	12/18/1948	20	--	--	24	21	--	Domestic	Water Reported to have	
394	5/3-5N3	Tsv	Tv	rock and lava	Ash or tuff	DR	8	6/1/1951	81.8	--	--	--	--	--	Domestic	high iron content.	
395	5/3-5P1	--	--	--	--	DR	--	1/1/1941	--	--	--	--	--	--	Domestic, irrigation	--	
396	5/4-5R1	Qyal, Qoal	Qal	clay, yellow	Clay	DR	8	6/1/1951	10.04	--	--	--	--	--	Domestic	Water reported to have	
397	5/3-6N2	Tsv	Tv	chalk rock (diatomite)	Clay and sand (or sandstone)	DR	8	12/1/1945	21	18	--	--	--	64.0	Domestic	high iron content and "sulfur" odor.	
398	5/4-5Q2	Qyal	Qal	clay, blue, and silt	Clay and sand (or sandstone)	DR	8	3/16/1951	6.94	--	--	5	--	--	Domestic	--	
399	5/4-1R1	--	--	--	--	DR	6	1/1/1946	--	--	--	--	--	--	Domestic	--	
400	5/3-6Q1	--	--	--	--	DR	8	1/1/1950	--	--	--	--	--	--	Domestic	--	
401	5/3-5N1	--	--	--	--	DR	8	1/1/1948	--	--	--	--	--	--	Domestic, dairy	irrigation	
402	5/3-6N1	Tsv	Tv	rock, blue	Ash or tuff	DR	6	1/1/1950	52.84	--	--	--	--	66.0	Domestic	--	
403	5/3-6N3	Tsv	Tv	rock and clay	Clay and gravel	DR	--	2/9/1950	2.32	--	--	--	--	--	Domestic	--	
404	5/4-3Q1	Qyal	Qal	dug well not described	No data	DR	8	2/14/1950	30.37	--	--	--	--	--	Irrigation	--	
405	5/4-12B1	Tsv	Tv	rock, hard	Ash or tuff	DR	6	3/10/1948	29.3	--	--	--	--	--	Domestic	--	
406	5/3-8C1	Tsv	Tv	soil	Sand and clay	DR	6	2/15/1950	Flowing	--	--	--	--	--	Domestic	--	
407	5/3-7D1	--	--	--	--	DR	10	1/1/1950	--	--	--	--	--	--	Domestic	--	
408	5/4-9D1	Tsv	Tv	tuff	Ash or tuff	DR	6	2/2/1950	25.32	--	--	--	--	--	Domestic	--	
409	5/4-12E1	Tsv	Tv	tuff, brown	Ash or tuff	DR	8	12/30/1949	30	--	--	--	--	--	Domestic	--	

**Appendix 2. Hydrologic data.—Continued**

[Site IDs and well number correspond to locations in Appendix 1; leaders (--), not reported]

Site ID	Well number	Reported geologic unit present in water interval <sup>1</sup>	Simplified geologic unit present in water interval <sup>2</sup>	Reported lithology in water-bearing interval <sup>3</sup>	Interpreted lithologic class in water-bearing interval <sup>4</sup>	Well type <sup>5</sup>	Casing diameter, in inches <sup>6</sup>	Date Water level Measured <sup>7</sup>	Water level distance below land surface datum, in ft	Discharge, in gal/min	Pump test duration, in hours	Bailing or pumping rate, in gal/min <sup>8</sup>	Drawdown, in ft <sup>9</sup>	Temperature, in °F	Use	Comment	
410	5/3-7E3	--	--	--	--	DR	12	2/19/1900	--	35	--	--	17	--	Domestic	High iron and H2S reported	
411	5/4-11E1	Qyal, Qoal	Qal	clay	Clay	DR	--	6/1/1918	Flowing	--	--	--	--	--	Abandoned	--	
412	5/4-9E1	Tsv	Tv	lava	Basalt	DR	12	1/1/1923	40	--	--	150	140	68.0	Irrigation	--	
413	5/4-12J1	Tsv	Tv	clay	Clay	DR	8	1/13/1950	31.97	--	--	--	--	--	Domestic	--	
414	5/4-9K2	Qyal, Qoal	Qal	surface	Sand and clay	DR	108	2/16/1950	5.3	--	--	--	--	--	Irrigation	--	
415	5/4-11L3	Qoal	Qal	sand and clay	Sand and clay	DR	8	6/1/1951	27.19	--	--	--	--	--	Domestic	--	
416	5/4-9L1	--	--	--	DR	--	1/1/1929	--	--	--	--	--	--	--	Domestic	--	
417	5/4-9Q1	--	--	--	DR	6	1/1/1946	--	--	--	--	--	--	--	Domestic	--	
418	5/4-10P4	--	--	--	DR	--	--	--	--	--	--	--	--	--	Abandoned	--	
419	5/4-14C1	Qoal	Qal	clay, yellow	Clay	DR	--	12/2/1949	12.86	--	--	--	--	--	Domestic, dairy	--	
420	5/4-15C2	--	--	--	DR	8	2/2/1951	16.02	--	24	15	--	--	--	Irrigation	--	
421	5/3-17C1	Tsv	Tv	rock, hard	Ash or tuff	DR	--	9/21/1948	100	--	--	--	--	--	Domestic	--	
422	5/4-13E1	Qoal	Qal	hardpan	Clay and gravel	DR	--	2/2/1950	35.2	--	--	--	--	--	Domestic	--	
423	5/4-14H3	Qoal	Qal	clay	Clay	DR	8	2/2/1950	57.83	--	--	--	--	--	Public supply	--	
424	5/4-17F1	--	--	--	DR	6	1/1/1938	--	--	--	--	--	--	--	Domestic	--	
425	5/4-13L1	Qoal	Qal	clay, blue, sandy gravel and clay	Clay and sand (or sandstone)	DR	15	10/17/1942	123.4	--	--	225	40	--	Irrigation	--	
426	5/4-14L2	Qoal	Qal	clay, blue, gravel; and boulders	Clay and gravel	DR	8	6/1/1918	Flowing	--	--	--	--	--	Abandoned	--	
427	5/4-14L1	Qoal	Qal	clay, blue	Clay and gravel	DR	20	10/17/1942	56.8	--	--	--	--	--	Public supply, irrigation	--	
428	5/4-15K1	Qyal, Qoal	Qal	boulders	Clay	DR	12	12/21/1949	48.31	--	--	--	--	--	Unused	--	
429	5/4-14P1	Qoal	Qal	boulders	Gravel	DR	14	1/4/1950	65	--	--	430	11	80.0	irrigation	--	
430	5/4-15P2	--	--	--	DR	--	1/1/1926	--	--	--	--	--	--	--	Unused	--	
431	5/4-21A1	--	--	--	DR	12	12/23/1949	--	--	--	400	--	--	--	Stock, irrigation	--	
432	5/4-19J1	Qt	Qal	soil	Sand and clay	DR	6	1/31/1950	2.44	--	--	--	--	--	Domestic	--	
433	5/4-19J2	Qt	Qal	clay, blue	Clay	DR	8	1/31/1950	2.64	--	--	--	--	--	Domestic	--	
434	5/4-21P2	Qt	Qal	shale, black	Clay and sand (or sandstone)	DR	8	3/26/1952	15.67	--	--	--	--	--	Domestic	--	
435	5/4-19R1	Qt	Qal	soil	Sand and clay	DR	--	1/31/1950	0	--	--	--	--	--	Unused	--	
436	5/4-19Q1	Qyal	Qal	silt black	Clay and sand (or sandstone)	DR	8	1/27/1950	16.46	--	--	--	--	--	--	--	--
437	5/4-27A1	Qoal	Qal	soil and gravel	Sand (or sandstone) and gravel	DR	12	9/21/1920	Flowing	--	--	--	--	--	Unused	Domestic, dairy,	--
438	5/4-30B2	Qyal	Qal	silt, black	Clay and sand (or sandstone)	DR	12	1/10/1947	Flowing	--	--	30	--	73.0	stock	--	
439	5/4-26B1	--	--	--	DR	20	1/24/1950	72.74	--	--	--	--	--	--	Public supply	--	
440	5/4-26E1	Qoal	Qal	clay, blue, and gravel	Clay and gravel	DR	15.5	1/24/1950	62.52	--	--	--	--	--	Public supply	--	
441	5/4-27H2	Qyal	Qal	clay, yellow; and gravel	Clay and gravel	DR	12	1/24/1950	64.13	--	--	--	--	--	Public supply	--	
442	5/5-26G1	Tsv	Tv	rock, blue tuff, water	Sandstone	DR	6	1/26/1950	57.4	--	--	--	--	--	Stock	--	
443	5/4-27H1	--	--	--	DR	16	1/1/1923	--	--	--	--	--	--	--	Unused	--	
444	5/4-29F1	Qh	QTc	clay, blue	Clay	DR	8	2/2/1951	58.72	--	--	--	--	--	Domestic	--	
445	5/4-27K2	Qyal, Qoal	Qal	soil	Sand and clay	DR	12	9/5/1919	Flowing	--	--	--	--	--	Abandoned	--	
446	5/4-26M1	Qyal, Qoal	Qal	clay, yellow, and gravel	Clay and gravel	DR	15.5	3/23/1942	35.3	--	--	--	--	--	Unused	--	
447	5/4-27K1	Qyal, Qoal	Qal	adobe, black	Sand and clay	DR	12	1/1/1919	Flowing	--	--	--	--	--	Abandoned	Well Plugged in 1931	
448	5/4-26M2	Qyal	Qal	soil	Sand and clay	DR	20	1/24/1950	2.17	--	--	--	--	--	Unused	Well probably plugged	
449	5/4-29K1	--	--	--	DR	--	1/1/1939	--	--	--	--	--	--	--	Abandoned	Well destroyed	
450	5/4-26N1	Qoal	Qal	clay and gravel	Clay and gravel	DR	20	1/24/1950	40.5	--	--	--	--	--	Unused	--	
451	5/4-29N2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
452	5/4-30R1	Qal, Qh	Qal, QTc	clay, yellow	Clay	DR	12	1/26/1950	Flowing	--	--	--	--	68.0	Unused	--	
453	5/4-29N1	--	--	--	Dug	--	1/26/1950	13.91	--	--	--	--	--	--	--	--	
454	5/4-29Q1	--	--	--	DR	--	1/1/1946	--	--	--	--	--	--	--	Abandoned	Well destroyed	
455	5/4-29Q2	--	--	--	DR	8	1/1/1946	--	--	--	--	--	--	--	Domestic	--	
456	5/4-27R1	--	--	--	DR	20	5/17/1931	--	--	270	--	--	--	--	Unused	--	
457	5/4-30P1	Qh	QTc	surface	Sand and clay	DR	10	1/26/1950	10.25	--	--	--	--	--	Unused	--	
458	5/4-27Q1	Qyal	Qal	hard gravel, salt water	Gravel	DR	8	12/21/1949	18.51	--	--	--	--	--	Unused	--	
459	5/4-27R2	--	--	--	DR	10	1/1/1930	--	--	--	--	--	--	--	Unused	--	

**Appendix 2.** Hydrologic data.—Continued

[Site IDs and well number correspond to locations in Appendix 1; leaders (--), not reported]

Site ID	Well number	Reported geologic unit present in water interval <sup>1</sup>	Simplified geologic unit present in water interval <sup>2</sup>	Reported lithology in water-bearing interval <sup>3</sup>	Interpreted lithologic class in water-bearing interval <sup>4</sup>	Well type <sup>5</sup>	Casing diameter, in inches <sup>6</sup>	Date Water level Measured <sup>7</sup>	Water level distance below land surface datum, in ft	Discharge, in gal/min	Pump test duration, in hours	Bailing or pumping rate, in gal/min <sup>8</sup>	Drawdown, in ft <sup>9</sup>	Temperature, in °F	Use	Comment
460	5/4-35R4	--	--	--	--	DR	--	1/1/1948	--	--	--	--	--	--	Unused	--
461	4/4-4C1	Qh (?)	QTc	clay, yellow	Clay	DR	8	1/1/1950	16.41	--	--	--	--	--	Domestic	--
462	4/4-5C1	--	--	--	--	--	--	1/1/1947	--	--	--	--	--	--	Domestic	--
463	4/4-16D1	Qyal, Qoal	Qal	tule mud	Clay and sand (or sandstone)	--	--	1/1/1950	0.42	--	--	--	--	--	Domestic, stock	--
464	4/4-16E1	--	--	--	--	DR	10	1/1/1950	--	--	--	--	--	--	Domestic	--

<sup>1</sup>Geologic units listed as published in the three Water-Supply Papers.

<sup>2</sup>Geologic unit abbreviations explained in table 2.

<sup>3</sup>Lithology transcribed exactly from driller's descriptions, as published in the three Water-Supply Papers.

<sup>4</sup>Assignment of interpreted lithologic class explained in table 1.

<sup>5</sup>D, drilled well, method unknown; DC, drilled by cabletool method; DR, drilled by rotary method; Dug, dug well; G, gravel-packed well. Multiple abbreviations shown where necessary.

<sup>6</sup>Where more than one casing size was used, the largest and smallest casing size used are listed. For dug wells, the largest dimension of the rectangular opening is listed.

<sup>7</sup>Date format is in Month/Day/Year.

<sup>8</sup>Rate for some wells is given in gallons per hour (gph).

<sup>9</sup>Drawdown defined as the difference, in feet, between static water level and pumping water level at end of pumping period.

### Appendix 3. Lithologic data.

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
1	22/13-2A3	1	22/13-2A3	0	146	0.0	44.5	gravel and boulders	Gravel	--	--	--	Qal
1	22/13-2A3			146	146	44.5	44.5	bedrock	Undifferentiated basement	hard	--	--	KJu
2	22/12-18N1	2	22/12-18N1	0	9	0.0	2.7	soil	Sand and clay	--	--	--	Qal
2	22/12-18N1			9	11	2.7	3.4	gravel	Gravel	--	--	--	
2	22/12-18N1			11	22	3.4	6.7	clay, gravelly	Clay and gravel	--	--	--	
2	22/12-18N1			22	23	6.7	7.0	gravel	Gravel	--	--	--	
2	22/12-18N1			23	31	7.0	9.4	clay, gravelly	Clay and gravel	--	--	--	
2	22/12-18N1			31	35	9.4	10.7	gravel	Gravel	--	--	--	
2	22/12-18N1			35	58	10.7	17.7	clay	Clay	--	--	--	
2	22/12-18N1			58	63	17.7	19.2	gravel	Gravel	--	--	--	
2	22/12-18N1			63	97	19.2	29.6	clay, gravelly	Clay and gravel	--	--	--	
2	22/12-18N1			97	101	29.6	30.8	gravel	Gravel	--	--	--	
2	22/12-18N1			101	114	30.8	34.7	clay gravelly	Clay and gravel	--	--	--	
2	22/12-18N1			114	116	34.7	35.4	gravel	Gravel	--	--	--	
2	22/12-18N1			116	180	35.4	54.9	clay gravel	Clay and gravel	--	--	--	
2	22/12-18N1			180	183	54.9	55.8	gravel	Gravel	--	--	--	
2	22/12-18N1			183	274	55.8	83.5	clay	Clay	--	--	--	
2	22/12-18N1			274	293	83.5	89.3	clay, hard, sandy	Clay and sand (or sandstone)	hard	--	--	
2	22/12-18N1			293	295	89.3	89.9	rocks	Gravel	hard	--	--	
2	22/12-18N1			295	359	89.9	109.4	gravel and clay	Clay and gravel	--	--	--	
2	22/12-18N1			359	361	109.4	110.0	gravel	Gravel	--	--	--	
2	22/12-18N1			361	452	110.0	137.8	gravel and clay	Clay and gravel	--	--	--	
2	22/12-18N1			452	452	137.8	137.8	rock	Gravel	hard	--	--	
3	22/12-19G2	3	22/12-19G2	0	10	0.0	3.0	surface soil and yellow clay	Sand and clay	--	--	--	Qal
3	22/12-19G2			10	20	3.0	6.1	yellow clay and gravel	Clay and gravel	--	--	--	
3	22/12-19G2			20	30	6.1	9.1	clay	Clay	--	--	--	
3	22/12-19G2			30	40	9.1	12.2	gravel and yellow clay	Clay and gravel	--	--	--	
3	22/12-19G2			40	50	12.2	15.2	coarse sand	Sand	--	--	--	
3	22/12-19G2			50	70	15.2	21.3	yellow clay	Clay	--	--	--	
3	22/12-19G2			70	90	21.3	27.4	sand and blue clay	Sand and clay	--	--	--	
3	22/12-19G2			90	120	27.4	36.6	coarse sand	Sand	--	--	--	
3	22/12-19G2			120	130	36.6	39.6	pea gravel	Gravel	--	--	--	
3	22/12-19G2			130	160	39.6	48.8	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
3	22/12-19G2			160	170	48.8	51.8	gravel	Gravel	--	--	--	
3	22/12-19G2			170	190	51.8	57.9	gray clay	Clay	--	--	--	
3	22/12-19G2			190	200	57.9	61.0	yellow clay	Clay	--	--	--	
3	22/12-19G2			200	210	61.0	64.0	sandy clay	Clay and sand (or sandstone)	--	--	--	
3	22/12-19G2			210	230	64.0	70.1	gravel, fine	Gravel	--	--	--	
3	22/12-19G2			230	240	70.1	73.2	sand with streaks of blue clay	Sand and clay	--	--	--	
3	22/12-19G2			240	250	73.2	76.2	yellow clay and gravel	Clay and gravel	--	--	--	
3	22/12-19G2			250	260	76.2	79.2	sand and gravel, small	Sand (or sandstone) and gravel	--	--	--	
3	22/12-19G2			260	270	79.2	82.3	blue sand, fine	Sand	--	--	--	
3	22/12-19G2			270	280	82.3	85.3	fine blue sand and gravel	Sand (or sandstone) and gravel	--	--	--	
3	22/12-19G2			280	300	85.3	91.4	yellow clay and gravel	Clay and gravel	--	--	--	
3	22/12-19G2			300	310	91.4	94.5	blue clay	Clay	--	--	--	
3	22/12-19G2			310	320	94.5	97.5	blue sandy clay	Clay and sand (or sandstone)	--	--	--	
3	22/12-19G2			320	330	97.5	100.6	streaked blue clay and gravel	Clay and gravel	--	--	--	
3	22/12-19G2			330	340	100.6	103.6	gray clay and gravel	Clay and gravel	--	--	--	
3	22/12-19G2			340	380	103.6	115.8	coarse sand and gravel	Sand (or sandstone) and gravel	--	--	--	
3	22/12-19G2			380	390	115.8	118.9	gravel	Gravel	--	--	--	
3	22/12-19G2			390	410	118.9	125.0	blue clay and gravel	Clay and gravel	--	--	--	QTc (?)
3	22/12-19G2			410	420	125.0	128.0	brown clay	Clay	--	--	--	
3	22/12-19G2			420	430	128.0	131.1	blue clay	Clay	--	--	--	
3	22/12-19G2			430	440	131.1	134.1	fine gravel	Gravel	--	--	--	
3	22/12-19G2			440	450	134.1	137.2	yellow clay and fine gravel	Clay and gravel	--	--	--	
3	22/12-19G2			450	460	137.2	140.2	hard red rock	Gravel	hard	--	--	
3	22/12-19G2			460	480	140.2	146.3	broken rock, shattered	Gravel	hard	--	--	
3	22/12-19G2			480	500	146.3	152.4	blue clay and coarse gravel	Clay and gravel	--	--	--	
3	22/12-19G2			500	508	152.4	154.8	yellow clay	Clay	--	--	--	
4	21/15-12K2	4	21/15-12K2	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qal and Qt (?)
4	21/15-12K2			3	21	0.9	6.4	yellow clay	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
4	21/15-12K2			21	37	6.4	11.3	yellow clay and gravel	Clay and gravel	--	--	--	
4	21/15-12K2			37	50	11.3	15.2	blue clay	Clay	--	--	--	
4	21/15-12K2			50	125	15.2	38.1	blue clay and gravel (water)	Clay and gravel	--	--	--	
4	21/15-12K2			125	129	38.1	39.3	gravel	Gravel	--	--	--	
4	21/15-12K2			129	180	39.3	54.9	blue clay and gravel	Clay and gravel	--	--	--	
4	21/15-12K2			180	201	54.9	61.3	yellow clay	Clay	--	--	--	
4	21/15-12K2			201	250	61.3	76.2	blue shale	Clay and sand (or sandstone)	cemented	--	--	KJu
5	21/15-13B1	5	21/15-13B1	0	10	0.0	3.0	surface soil	Sand and clay	--	--	--	Qal
5	21/15-13B1			10	40	3.0	12.2	coarse sand	Sand	--	--	--	
5	21/15-13B1			40	60	12.2	18.3	pea gravel	Gravel	--	--	--	
5	21/15-13B1			60	80	18.3	24.4	gray sand	Sand	--	--	--	
5	21/15-13B1			80	120	24.4	36.6	gray sand and gravel	Sand (or sandstone) and gravel	--	--	--	
5	21/15-13B1			120	130	36.6	39.6	hard shale	Clay and sand (or sandstone)	hard	--	--	Qt
5	21/15-13B1			130	140	39.6	42.7	cemented gravel	Gravel	cemented	--	--	
5	21/15-13B1			140	170	42.7	51.8	brown clay and large gravel	Clay and gravel	--	--	--	
5	21/15-13B1			170	190	51.8	57.9	pea gravel	Gravel	--	--	--	
5	21/15-13B1			190	220	57.9	67.1	blue clay and gravel	Clay and gravel	--	--	--	
5	21/15-13B1			220	250	67.1	76.2	green sand	Sand	--	--	--	
5	21/15-13B1			250	280	76.2	85.3	blue clay and green sand	Clay and sand (or sandstone)	--	--	--	
								hard blue rock with streaks of sand					
5	21/15-13B1			280	320	85.3	97.5	Sandstone	hard	--	--	--	
5	21/15-13B1			320	330	97.5	100.6	blue clay with large gravel	Clay and gravel	--	--	--	
5	21/15-13B1			330	340	100.6	103.6	red rock, hard	Undifferentiated basement	hard	--	--	KJu
5	21/15-13B1			340	350	103.6	106.7	porous red volcanic rock	Undifferentiated basement	hard	--	--	
5	21/15-13B1			350	370	106.7	112.8	red volcanic rock	Undifferentiated basement	hard	--	--	
5	21/15-13B1			370	400	112.8	121.9	black basalt rock	Undifferentiated basement	hard	--	--	
5	21/15-13B1			400	440	121.9	134.1	red volcanic rock	Undifferentiated basement	hard	--	--	
5	21/15-13B1			440	500	134.1	152.4	red and black rock	Undifferentiated basement	hard	--	--	
5	21/15-13B1			500	528	152.4	160.9	black and green rock, hard	Undifferentiated basement	hard	--	--	
6	21/15-14A1	6	21/15-14A1	0	2	0.0	0.6	surface soil	Sand and clay	--	--	--	Qt
6	21/15-14A1			2	25	0.6	7.6	yellow clay and gravel	Clay and gravel	--	--	--	
6	21/15-14A1			25	29	7.6	8.8	blue clay	Clay	--	--	--	
6	21/15-14A1			29	49	8.8	14.9	yellow clay and gravel	Clay and gravel	--	--	--	
7	21/14-30M1	7	21/14-30M1	0	1	0.0	0.3	topsoil	Sand and clay	--	--	--	Qal
7	21/14-30M1			1	15	0.3	4.6	yellow clay and pea gravel	Clay and gravel	--	--	--	
7	21/14-30M1			15	18	4.6	5.5	blue clay	Clay	--	--	--	
7	21/14-30M1			18	23	5.5	7.0	gravel	Gravel	--	--	--	
8	21/14-31J1	8	21/14-31J1	0	10	0.0	3.0	topsoil and yellow clay	Sand and clay	--	--	--	Qal
8	21/14-31J1			10	20	3.0	6.1	yellow clay and pea gravel	Clay and gravel	--	--	--	
8	21/14-31J1			20	30	6.1	9.1	blue clay	Clay	--	--	--	
8	21/14-31J1			30	50	9.1	15.2	coarse sand	Sand	--	--	--	
8	21/14-31J1			50	80	15.2	24.4	sand and fine gravel	Sand (or sandstone) and gravel	--	--	--	
8	21/14-31J1			80	100	24.4	30.5	blue sand	Sand	--	--	--	
8	21/14-31J1			100	110	30.5	33.5	green sandy silt	Clay and sand (or sandstone)	--	--	--	
8	21/14-31J1			110	130	33.5	39.6	red and black rock	Undifferentiated basement	hard	--	--	KJu
8	21/14-31J1			130	140	39.6	42.7	blue and black rock	Undifferentiated basement	hard	--	--	
								blue and black rock with salt white ashy streaks	Undifferentiated basement	hard	--	--	
8	21/14-31J1			140	405	42.7	123.4						
9	18/13-18H1	9	18/13-18H1	0	25	0.0	7.6	surface soil	Sand and clay	--	--	--	Qal and QTc (?)
9	18/13-18H1			25	30	7.6	9.1	brown clay	Clay	--	--	--	
9	18/13-18H1			30	40	9.1	12.2	coarse sand	Sand	--	--	--	
9	18/13-18H1			40	68	12.2	20.7	blue clay	Clay	--	--	--	
9	18/13-18H1			68	250	20.7	76.2	coarse	Clay and gravel	--	--	--	
9	18/13-18H1			250	305	76.2	93.0	coarse gravel and blue clay	Clay and gravel	--	--	--	
9	18/13-18H1			305	332	93.0	101.2	blue clay	Clay	--	--	--	
9	18/13-18H1			332	354	101.2	107.9	blue clay with gravel	Clay and gravel	--	--	--	
10	18/13-19B1	10	18/13-19B1	0	14	0.0	4.3	topsoil	Sand and clay	--	--	--	Qal and QTc (?)
10	18/13-19B1			14	16	4.3	4.9	fine sand	Sand	--	--	--	
10	18/13-19B1			16	23	4.9	7.0	clay	Clay	--	--	--	
10	18/13-19B1			23	29	7.0	8.8	blue clay	Clay	--	--	--	
10	18/13-19B1			29	36	8.8	11.0	coarse sand	Sand	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
10	18/13-19B1			36	38	11.0	11.6	blue clay	Clay	--	--	--	
10	18/13-19B1			38	79	11.6	24.1	coarse gravel	Gravel	--	--	--	
10	18/13-19B1			79	82	24.1	25.0	blue clay	Clay	--	--	--	
10	18/13-19B1			82	152	25.0	46.3	coarse gravel	Gravel	--	--	--	
10	18/13-19B1			152	174	46.3	53.0	blue clay	Clay	--	--	--	
10	18/13-19B1			174	196	53.0	59.7	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
10	18/13-19B1			196	282	59.7	86.0	blue clay	Clay	--	--	--	
10	18/13-19B1			282	289	86.0	88.1	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
10	18/13-19B1			289	320	88.1	97.5	blue sand, coarse	Sand	--	--	--	
10	18/13-19B1			320	345	97.5	105.2	brown sand, coarse	Sand	--	--	--	
10	18/13-19B1			345	350	105.2	106.7	gray sand, coarse	Sand	--	--	--	
10	18/13-19B1			350	362	106.7	110.3	multicolored sand, coarse	Sand	--	--	--	
10	18/13-19B1			362	372	110.3	113.4	yellow sandy clay	Clay and sand (or sandstone)	--	--	--	
10	18/13-19B1			372	410	113.4	125.0	blue clay	Clay	--	--	--	
10	18/13-19B1			410	430	125.0	131.1	coarse brown sand	Sand	--	--	--	
10	18/13-19B1			430	444	131.1	135.3	brown sandy clay with gravel	Clay, sand, and gravel	--	--	--	
10	18/13-19B1			444	454	135.3	138.4	blue clay and gravel	Clay and gravel	--	--	--	
11	18/13-20P2	11	18/13-20P2	0	14	0.0	4.3	yellow clay	Clay	--	--	--	QTc
11	18/13-20P2			14	22	4.3	6.7	water gravel	Clay and gravel	--	--	--	
11	18/13-20P2			22	55	6.7	16.8	blue clay	Clay	--	--	--	
11	18/13-20P2			55	60	16.8	18.3	water gravel (50 gpm)	Gravel	--	--	--	
								blue clay (buried coniferous forest					
11	18/13-20P2			60	72	18.3	21.9	at 72 ft.)	Clay	--	--	--	
12	18/13-31A1	12	18/13-31A1	0	2	0.0	0.6	soil	Sand and clay	--	--	--	QTc
12	18/13-31A1			2	34	0.6	10.4	yellow clay and gravel	Clay and gravel	--	--	--	
12	18/13-31A1			34	37	10.4	11.3	blue clay and gravel	Clay and gravel	--	--	--	
12	18/13-31A1			37	39	11.3	11.9	blue clay, sticky	Clay	--	--	--	
12	18/13-31A1			39	51	11.9	15.5	(no record)	No data	--	--	--	
12	18/13-31A1			51	60	15.5	18.3	blue clay	Clay	--	--	--	
12	18/13-31A1			60	67	18.3	20.4	blue clay and gravel	Clay and gravel	--	--	--	
12	18/13-31A1			67	79	20.4	24.1	blue clay	Clay	--	--	--	
12	18/13-31A1			79	80	24.1	24.4	blue clay and gravel	Clay and gravel	--	--	--	
12	18/13-31A1			80	100	24.4	30.5	blue clay	Clay	--	--	--	
12	18/13-31A1			100	124	30.5	37.8	yellow cemented gravel	Clay, sand, and gravel	cemented	--	--	
12	18/13-31A1			124	151	37.8	46.0	blue clay	Clay	--	--	--	
12	18/13-31A1			151	158	46.0	48.2	yellow clay and gravel	Clay and gravel	--	--	--	
12	18/13-31A1			158	187	48.2	57.0	blue clay	Clay	--	--	--	
12	18/13-31A1			187	192	57.0	58.5	blue clay and gravel	Clay and gravel	--	--	--	
12	18/13-31A1			192	200	58.5	61.0	blue clay and boulders	Clay and gravel	--	--	--	
12	18/13-31A1			200	214	61.0	65.2	yellow clay and gravel	Clay and gravel	--	--	--	
12	18/13-31A1			214	240	65.2	73.2	blue clay and gravel	Clay and gravel	--	--	--	
12	18/13-31A1			240	250	73.2	76.2	blue clay	Clay	--	--	--	
12	18/13-31A1			250	260	76.2	79.2	yellow clay	Clay	--	--	--	
12	18/13-31A1			260	285	79.2	86.9	blue clay	Clay	--	--	--	
12	18/13-31A1			285	287	86.9	87.5	yellow sand and gravel	Sand (or sandstone) and gravel	--	--	--	
12	18/13-31A1			287	289	87.5	88.1	yellow clay	Clay	--	--	--	
13	17/11-33D1	13	17/11-33D1	0	2.5	0.0	0.8	topsoil	Sand and clay	--	--	--	Qal
13	17/11-33D1			2.5	17	0.8	5.2	yellow clay	Clay	--	--	--	Qt (?)
13	17/11-33D1			17	375	5.2	114.3	blue clay	Clay	--	--	--	QTm
13	17/11-33D1			375	430	114.3	131.1	rock	Undifferentiated basement	hard	--	--	KJu
13	17/11-33D1			430	431	131.1	131.4	hard formation	Undifferentiated basement	hard	--	--	
13	17/11-33D1			431	459	131.4	139.9	shale	Undifferentiated basement	cemented	--	--	
13	17/11-33D1			459	570	139.9	173.7	hard blue rock	Undifferentiated basement	hard	--	--	
13	17/11-33D1			570	617	173.7	188.1	rock	Undifferentiated basement	hard	--	--	
								hard blue rock (Interval from 375 to 658 ft. further described as gray fairly coarse textured rock in hard and soft layers)					
13	17/11-33D1			617	658	188.1	200.6	yellow-brown gravelly clay, 1 to 3 in. angular gravel, small percentage of sand	Undifferentiated basement	hard	--	--	
14	16/12W-34N:	14	16/12W-34N:	0	14.5	0.0	4.4	Clay and gravel	Clay and gravel	--	--	--	Qt

**Appendix 3.** Lithologic data.—Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
14	16/12W-34N2			14.5	18	4.4	5.5	brown sandy gravel, small percent clay brown sandy gravel, 1 to 4 in. angular to round, small percentage of clay olive-drab sandy clay, well consolidated	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			18	25	5.5	7.6	blue clayey sand, very tight brown sandy clay, well consolidated, occasional streaks of blue sand, and small percentage of small pebbles	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			25	30.5	7.6	9.3	blue clayey sand, 1 to 3 in. angular to round, well cemented, 1 to 3 in. angular to round	Sand and clay	--	--	--	QTm
14	16/12W-34N2			30.5	32	9.3	9.8	blue clayey sand, 1 to 3 in. angular to round, well cemented, 1 to 3 in. angular to round	Sand and clay	--	--	--	
14	16/12W-34N2			32	39	9.8	11.9	blue gravelly sand, 1 to 2 in. angular to round	Clay, sand, and trace gravel	--	--	--	
14	16/12W-34N2			39	40	11.9	12.2	blue sandy gravel, loosely cemented, 1 to 3 in. angular to round	Sand (or sandstone) and gravel	--	--	--	
14	16/12W-34N2			40	57	12.2	17.4	blue gravel conglomerate, very well consolidated	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			57	58	17.4	17.7	blue sandy gravel, loosely cemented, 1 to 3 in. angular to round	Gravel	cemented	--	--	
14	16/12W-34N2			58	65	17.7	19.8	blue clayey sand with some pebbles	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			65	68.5	19.8	20.9	blue sandy clayey gravel, 1 to 3 in. angular to round, consolidated with clayey matrix	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			68.5	76	20.9	23.2	blue gravelly clayey sand, 1 to 4 in. angular to round	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			76	77	23.2	23.5	blue clayey sand, well-consolidated, occasional streaks of olive-drab fine sandy clay	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			77	83.5	23.5	25.5	blue gravelly clayey sand, well-consolidated	Sand and clay	--	--	--	
14	16/12W-34N2			83.5	85	25.5	25.9	blue clayey sand, with streaks of pebbles and streaks of olive-drab fine sandy clay	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			85	88.5	25.9	27.0	blue clayey sand with streaks of olive-drab sandy clay, extremely well consolidated	Sand and clay	--	--	--	
14	16/12W-34N2			88.5	93	27.0	28.3	blue clayey sand, extremely well consolidated	Sand and clay	--	--	--	
14	16/12W-34N2			93	94	28.3	28.7	blue clayey sand with streaks of olive-drab clay	Sand and clay	--	--	--	
14	16/12W-34N2			94	96.5	28.7	29.4	blue clayey sand with streaks of olive-drab clay	Sand and clay	--	--	--	
14	16/12W-34N2			96.5	97.5	29.4	29.7	blue clayey sand with pebbles	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			97.5	99	29.7	30.2	blue clayey gravelly sand	Sand (or sandstone) and gravel	--	--	--	
14	16/12W-34N2			99	107	30.2	32.6	blue sandy gravel, loosely consolidated, 1 to 4 in. angular to round	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			107	154	32.6	46.9	blue sandy clayey gravel, 1 to 3 in. angular to round, well-consolidated, clay matrix (losing water in hole)	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			154	171.5	46.9	52.3	blue sandy clayey gravel, 1 to 2 in. angular to round, well-consolidated, clayey matrix	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			171.5	173	52.3	52.7	blue clayey gravelly sand, streaks of olive-drab clayey sand, well-consolidated	Clay, sand, and gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
14	16/12W-34N2			173	176.5	52.7	53.8	olive-drab clayey sand, well-consolidated, occasional streaks of blue sandy clay	Sand and clay	--	--	--	
14	16/12W-34N2			176.5	178.5	53.8	54.4	blue sandy clay with occasional streaks of olive-drab clayey sand	Clay and sand (or sandstone)	--	--	--	
14	16/12W-34N2			178.5	179.5	54.4	54.7	blue clayey sand with pebbles	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			179.5	195.5	54.7	59.6	blue sandy clayey gravel, well-consolidated, clay matrix, 1 to 3 in. angular to round	Clay, sand, and gravel	--	--	--	
14	16/12W-34N2			195.5	210.5	59.6	64.2	blue sandy clayey gravel well-consolidated, clayey matrix, 1 to 2 in. angular to round. some conglomerate in last 3.5 ft.	Clay, sand, and gravel	--	--	--	
15	14/12-5K1	15	14/12-5K1	0	2	0.0	0.6	surface	Sand and clay	--	--	--	Qyal
15	14/12-5K1			2	15	0.6	4.6	clay, sand, and gravel	Clay, sand, and gravel	--	--	--	
15	14/12-5K1			15	20	4.6	6.1	boulders and clay	Clay and gravel	--	--	--	
15	14/12-5K1			20	38	6.1	11.6	yellow sand, clay and gravel	Sand (or sandstone) and gravel	--	--	--	
15	14/12-5K1			38	45	11.6	13.7	yellow clay, hard	Clay	hard	--	--	
15	14/12-5K1			45	60	13.7	18.3	yellow cemented gravel	Clay, sand, and gravel	cemented	--	--	
15	14/12-5K1			60	64	18.3	19.5	yellow sand	Sand	--	--	--	
15	14/12-5K1			64	78	19.5	23.8	yellow cemented gravel	Clay, sand, and gravel	cemented	--	--	
15	14/12-5K1			78	84	23.8	25.6	blue clay and gravel	Clay and gravel	--	--	--	
15	14/12-5K1			84	94	25.6	28.7	blue rock	Undifferentiated basement	hard	--	--	KJu
16	14/12-26H	16	14/12-26H	0	10	0.0	3.0	sand	Sand	--	--	--	Qal
16	14/12-26H			10	17	3.0	5.2	loose gravel	Gravel	--	--	--	
16	14/12-26H			17	25	5.2	7.6	yellow sandy clay gravel	Clay, sand, and gravel	--	--	--	
16	14/12-26H			25	55	7.6	16.8	cemented gravel, hard	Gravel	cemented	--	--	
16	14/12-26H			55	62	16.8	18.9	soft gravel	Gravel	--	--	--	
16	14/12-26H			62	65	18.9	19.8	hard	Gravel	hard	--	--	
17	13/11-8H1	17	13/11-8H1	0	10	0.0	3.0	medium gravelly brown soil	Clay, sand, and gravel	--	--	--	QTc
17	13/11-8H1			10	30	3.0	9.1	fine gravelly yellow clay	Sand (or sandstone) and gravel	--	--	--	
17	13/11-8H1			30	32	9.1	9.8	blue sand; water	Sand	--	--	--	
17	13/11-8H1			32	46	9.8	14.0	yellow sandy clay	Clay and sand (or sandstone)	--	--	--	
17	13/11-8H1			46	50	14.0	15.2	fine blue sand, water	Sand	--	--	--	
17	13/11-8H1			50	77	15.2	23.5	sedimentary lake debris	Clay and sand (or sandstone)	--	--	--	
17	13/11-8H1			77	97	23.5	29.6	large blue gravel; water	Gravel	--	--	--	
17	13/11-8H1			97	147	29.6	44.8	blue sedimentary sandy clay	Clay and sand (or sandstone)	--	--	--	
17	13/11-8H1			147	152	44.8	46.3	decayed vegetation	No data	--	--	plants	
17	13/11-8H1			152	166	46.3	50.6	blue packed coarse gravel	Gravel	--	--	--	
17	13/11-8H1			166	168	50.6	51.2	fine blue sand and gravel; water	Sand (or sandstone) and gravel	--	--	--	
17	13/11-8H1			168	178	51.2	54.3	light blue sandstone	Sandstone	cemented	--	--	
17	13/11-8H1			178	187	54.3	57.0	large brown gravel; water	Gravel	--	--	--	
18	13/11-18D1	18	13/11-18D1	0	2	0.0	0.6	topsoil	Sand and clay	--	--	--	Qal
18	13/11-18D1			2	10	0.6	3.0	yellow clay	Clay	--	--	--	
18	13/11-18D1			10	25	3.0	7.6	sand	Sand	--	--	--	
18	13/11-18D1			25	51	7.6	15.5	blue gravel, coarse	Gravel	--	--	--	
18	13/11-18D1			51	55	15.5	16.8	gravel	Gravel	--	--	--	
18	13/11-18D1			55	61	16.8	18.6	blue clay and gravel	Clay and gravel	--	--	--	
19	13/11-18M1	19	13/11-18M1	0	22	0.0	6.7	topsoil	Sand and clay	--	--	--	Qal
19	13/11-18M1			22	63	6.7	19.2	gravel	Gravel	--	--	--	
19	13/11-18M1			63	63	19.2	19.2	blue clay	Clay	--	--	--	
20	13/11-22G	20	13/11-22G	0	1	0.0	0.3	soil	Sand and clay	--	--	--	Qal and QTc
20	13/11-22G			1	20	0.3	6.1	brown clay and gravel	Clay and gravel	--	--	--	
20	13/11-22G			20	32	6.1	9.8	sandy blue clay	Clay and sand (or sandstone)	--	--	--	
20	13/11-22G			32	35	9.8	10.7	gravel, some water	Gravel	--	--	--	
20	13/11-22G			35	50	10.7	15.2	sandy blue clay	Clay and sand (or sandstone)	--	--	--	
20	13/11-22G			50	53	15.2	16.2	gravel	Gravel	--	--	--	
20	13/11-22G			53	78	16.2	23.8	blue clay	Clay	--	--	--	
20	13/11-22G			78	83	23.8	25.3	gravel	Gravel	--	--	--	
20	13/11-22G			83	191	25.3	58.2	blue clay	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
20	13/11-22G			191	202	58.2	61.6	good gravel	Gravel	--	--	--	
20	13/11-22G			202	204	61.6	62.2	blue clay	Clay	--	--	--	
20	13/11-22G			204	205	62.2	62.5	bedrock	Gravel				KJu
21	13/11-21L2	21	13/11-21L2	0	8	0.0	2.4	soil	Sand and clay	hard	--	--	Qal
21	13/11-21L2			8	18	2.4	5.5	yellow clay	Clay	--	--	--	
21	13/11-21L2			18	26	5.5	7.9	sand, coarse	Sand	--	--	--	
21	13/11-21L2			26	34	7.9	10.4	blue clay	Clay	--	--	--	
21	13/11-21L2			34	46	10.4	14.0	gravel	Gravel	--	--	--	
21	13/11-21L2			46	53	14.0	16.2	clay, broken	Clay	--	--	--	QTm
21	13/11-21L2			53	78	16.2	23.8	gravel	Gravel	--	--	--	
21	13/11-21L2			78	88	23.8	26.8	clay, broken	Clay	--	--	--	
21	13/11-21L2			88	96	26.8	29.3	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
21	13/11-21L2			96	106	29.3	32.3	clay, soft	Clay	--	--	--	
21	13/11-21L2			106	112	32.3	34.1	broken gravel and sand	Sand (or sandstone) and gravel	--	--	--	
21	13/11-21L2			112	150	34.1	45.7	hard clay	Clay	hard	--	--	
21	13/11-21L2			150	165	45.7	50.3	boulders, rough	Gravel	--	--	--	KJu
21	13/11-21L2			165	169	50.3	51.5	hard clay	Clay	hard	--	--	
21	13/11-21L2			169	200	51.5	61.0	hard blue shale	Clay and sand (or sandstone)	hard	--	--	
21	13/11-21L2			200	202	61.0	61.6	gravel	Gravel	--	--	--	
21	13/11-21L2			202	220	61.6	67.1	blue shale and rock	Gravel	cemented	--	--	
22	13/11-19Q1	22	13/11-19Q1	0	3	0.0	0.9	surface	Sand and clay	--	--	--	Qal and QTm
22	13/11-19Q1			3	14	0.9	4.3	gravel, large, and sand	Sand (or sandstone) and gravel	--	--	--	
22	13/11-19Q1			14	40	4.3	12.2	gravel	Gravel	--	--	--	
22	13/11-19Q1			40	52	12.2	15.8	gravel, large	Gravel	--	--	--	
22	13/11-19Q1			52	54	15.8	16.5	clay, blue	Clay	--	--	--	
22	13/11-19Q1			54	75	16.5	22.9	gravel, large blue	Gravel	--	--	--	
22	13/11-19Q1			75	79	22.9	24.1	clay, blue, and gravel	Clay and gravel	--	--	--	
22	13/11-19Q1			79	100	24.1	30.5	clay, sticky blue	Clay	--	--	--	
22	13/11-19Q1			100	114	30.5	34.7	gravel	Gravel	--	--	--	
23	11/10-17R1	23	11/10-17R1	0	2	0.0	0.6	surface solid	Sand and clay	--	--	--	Qal
23	11/10-17R1			2	12	0.6	3.7	yellow sand and scattered gravel	Sand (or sandstone) and gravel	--	--	--	
23	11/10-17R1			12	18	3.7	5.5	brown silt, moist	Sand and clay	--	--	--	
23	11/10-17R1			18	39	5.5	11.9	loose gravel and yellow sand	Sand (or sandstone) and gravel	--	--	--	
23	11/10-17R1			39	41	11.9	12.5	hard blue rock, broken	Undifferentiated basement	hard	--	--	KJu
24	11/10-28L1	24	11/10-28L1	0	18.5	0.0	5.6	river gravel	Gravel	--	--	--	Qal
24	11/10-28L1			18.5	20	5.6	6.1	bedrock	Gravel	hard	--	--	KJu
25	11/10-33A	25	11/10-33A	0	12	0.0	3.7	gravel (dry)	Gravel	--	--	--	Qal
25	11/10-33A			12	20	3.7	6.1	gravel (water)	Gravel	--	--	--	
25	11/10-33A			20	40	6.1	12.2	shale	Clay and sand (or sandstone)	cemented	--	--	KJu
26	10/11-12Q1	26	10/11-12Q1	0	10	0.0	3.0	gravel and sand	Sand (or sandstone) and gravel	--	--	--	Qal
26	10/11-12Q1			10	20	3.0	6.1	gravel and small boulders	Gravel	--	--	--	
26	10/11-12Q1			20	38	6.1	11.6	big rocks and gravel	Gravel	--	--	--	
26	10/11-12Q1			38	42	11.6	12.8	clay and brown gravel	Clay and gravel	--	--	--	
26	10/11-12Q1			42	47	12.8	14.3	large gravel	Gravel	--	--	--	
26	10/11-12Q1			47	55	14.3	16.8	blue clay	Clay	--	--	--	
27	10/9-26L1	27	10/9-26L1	0	12	0.0	3.7	topsoil	Sand and clay	--	--	--	Qal and QTge
27	10/9-26L1			12	37	3.7	11.3	sand and small gravel	Sand (or sandstone) and gravel	--	--	--	
27	10/9-26L1			37	44	11.3	13.4	tight clay, yellow	Clay	--	--	--	
27	10/9-26L1			44	51	13.4	15.5	medium small gravel	Gravel	--	--	--	
27	10/9-26L1			51	80	15.5	24.4	sticky clay	Clay	--	--	--	
27	10/9-26L1			80	87	24.4	26.5	sand	Sand	--	--	--	
27	10/9-26L1			87	109	26.5	33.2	blue clay	Clay	--	--	--	
27	10/9-26L1			109	119	33.2	36.3	clay and mixed sand	Clay and sand (or sandstone)	--	--	--	
27	10/9-26L1			119	127	36.3	38.7	tight mica sand	Sand	--	--	--	
27	10/9-26L1			127	134	38.7	40.8	sand and small gravel	Sand (or sandstone) and gravel	--	--	--	
27	10/9-26L1			134	142	40.8	43.3	pea gravel and sand	Sand (or sandstone) and gravel	--	--	--	
27	10/9-26L1			142	145	43.3	44.2	pea gravel	Gravel	--	--	--	
27	10/9-26L1			145	150	44.2	45.7	clay	Clay	--	--	--	
27	10/9-26L1			150	155	45.7	47.2	yellow sand and gravel	Sand (or sandstone) and gravel	--	--	--	
27	10/9-26L1			155	163	47.2	49.7	sandy yellow clay	Clay and sand (or sandstone)	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
27	10/9-26L1			163	170	49.7	51.8	gray clay	Clay	--	--	--	
27	10/9-26L1			170	172	51.8	52.4	gravel	Gravel	--	--	--	
27	10/9-26L1			172	192	52.4	58.5	sandy soil	Sand and clay	--	--	--	
27	10/9-26L1			192	210	58.5	64.0	gray clay and sand	Clay and sand (or sandstone)	--	--	--	
27	10/9-26L1			210	216	64.0	65.8	gravel	Gravel	--	--	--	
27	10/9-26L1			216	220	65.8	67.1	gray mud	Clay and sand (or sandstone)	--	--	--	
27	10/9-26L1			220	224	67.1	68.3	gravel	Gravel	--	--	--	
27	10/9-26L1			224	240	68.3	73.2	gravel and blue mud	Clay, sand, and gravel	--	--	--	
27	10/9-26L1			240	244	73.2	74.4	gray mud	Clay and sand (or sandstone)	--	--	--	
28	9/10-2B3	28	9/10-2B3	0	18	0.0	5.5	clay and silt	Clay and sand (or sandstone)	--	--	--	Qal and Qt and QTge (?)
28	9/10-2B3			18	30	5.5	9.1	gravel	Gravel	--	--	--	
28	9/10-2B3			30	50	9.1	15.2	mostly clay and clay and gravel	Clay and gravel	--	--	--	
28	9/10-2B3			50	56	15.2	17.1	gravel (6 ft. thick) near 55 ft.	Gravel	--	--	--	
28	9/10-2B3			56	160	17.1	48.8	(not logged)	No data	--	--	--	
28	9/10-2B3			160	167	48.8	50.9	gravel (7 ft. thick) near 160 ft.	Gravel	--	--	--	
28	9/10-2B3			167	285	50.9	86.9	bottom in soft clay and gravel	Clay and gravel	--	--	--	
29	9/10-2B1	29	9/10-2B1	0	17	0.0	5.2	topsoil	Sand and clay	--	--	--	Qal
29	9/10-2B1			17	23	5.2	7.0	sand	Sand	--	--	--	
29	9/10-2B1			23	37	7.0	11.3	clay	Clay	--	--	--	
29	9/10-2B1			37	43	11.3	13.1	gravel, pea	Gravel	--	--	--	
29	9/10-2B1			43	49	13.1	14.9	boulders, large (to 1 ft., diameter)	Gravel	--	--	--	
29	9/10-2B1			49	73	14.9	22.3	shale (hard blue clay)	Clay and sand (or sandstone)	hard	--	--	
29	9/10-2B1			73	87	22.3	26.5	sticky gumbo (like rubber)	Clay and sand (or sandstone)	--	--	--	
29	9/10-2B1			87	89	26.5	27.1	sand and clay, mixed	Sand and clay	--	--	--	
29	9/10-2B1			89	99	27.1	30.2	gravel	Gravel	--	--	--	
29	9/10-2B1			99	107	30.2	32.6	shale and serpentine	Undifferentiated basement	cemented	--	--	KJu
30	9/9-4E1	30	9/9-4E1	0	12	0.0	3.7	topsoil	Sand and clay	--	--	--	
30	9/9-4E1			12	18	3.7	5.5	sand and small gravel	Sand (or sandstone) and gravel	--	--	--	
30	9/9-4E1			18	37	5.5	11.3	clay and mixed gravel	Clay and gravel	--	--	--	
30	9/9-4E1			37	76	11.3	23.2	clay	Clay	--	--	--	
30	9/9-4E1			76	81	23.2	24.7	clay and mixed boulders	Clay and gravel	--	--	--	
30	9/9-4E1			81	89	24.7	27.1	shale	Clay and sand (or sandstone)	cemented	--	--	
30	9/9-4E1			89	96	27.1	29.3	rock	Gravel	hard	--	--	
30	9/9-4E1			96	98	29.3	29.9	clay	Clay	--	--	--	
30	9/9-4E1			98	104	29.9	31.7	rock	Gravel	hard	--	--	
30	9/9-4E1			104	108	31.7	32.9	clay	Clay	--	--	--	
30	9/9-4E1			108	112	32.9	34.1	clay, boulders	Clay and gravel	--	--	--	
30	9/9-4E1			112	116	34.1	35.4	boulders, small gravel, and sand	Sand (or sandstone) and gravel	--	--	--	
30	9/9-4E1			116	117	35.4	35.7	shale	Clay and sand (or sandstone)	cemented	--	--	
31	9/8-7Q1	31	9/8-7Q1	0	4	0.0	1.2	topsoil	Sand and clay	--	--	--	Qal and QTge
31	9/8-7Q1			4	19	1.2	5.8	brown clay	Clay	--	--	--	
31	9/8-7Q1			19	40	5.8	12.2	blue sand and large gravel	Sand (or sandstone) and gravel	--	--	--	
31	9/8-7Q1			40	75	12.2	22.9	blue clay and sand	Clay and sand (or sandstone)	--	--	--	
31	9/8-7Q1			75	92	22.9	28.0	soft blue clay	Clay	--	--	--	
31	9/8-7Q1			92	130	28.0	39.6	hard blue clay	Clay	hard	--	--	
31	9/8-7Q1			130	147	39.6	44.8	soft blue sand	Sand	--	--	--	
31	9/8-7Q1			147	160	44.8	48.8	hard blue shale	Clay and sand (or sandstone)	hard	--	--	
31	9/8-7Q1			160	200	48.8	61.0	soft sand	Sand	--	--	--	
31	9/8-7Q1			200	476	61.0	145.1	soft blue sand, and shale streaks	Sand and clay	cemented	--	--	
31	9/8-7Q1			476	490	145.1	149.4	blue clay	Clay	--	--	--	
32	9/9-21R1	32	9/9-21R1	0	20	0.0	6.1	sediment	Sand	--	--	--	Qal
32	9/9-21R1			20	30	6.1	9.1	gravel	Gravel	--	--	--	
32	9/9-21R1			30	36	9.1	11.0	gravel and boulders	Gravel	--	--	--	
32	9/9-21R1			36	41	11.0	12.5	boulders and clay	Clay and gravel	--	--	--	
32	9/9-21R1			41	55	12.5	16.8	boulders	Gravel	--	--	--	
32	9/9-21R1			55	113	16.8	34.4	blue clay	Clay	--	--	--	
32	9/9-21R1			113	138	34.4	42.1	gravel	Gravel	--	--	--	
32	9/9-21R1			138	154	42.1	46.9	blue clay	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
32	9/9-21R1			154	164	46.9	50.0	brown shale	Clay and sand (or sandstone)	cemented	--	--	
32	9/9-21R1			164	167	50.0	50.9	blue clay	Clay	--	--	--	
32	9/9-21R1			167	170	50.9	51.8	brown clay	Clay	--	--	--	
32	9/9-21R1			170	173	51.8	52.7	blue clay	Clay	--	--	--	
32	9/9-21R1			173	177.5	52.7	54.1	shale	Clay and sand (or sandstone)	cemented	--	--	KJu
33	9/9-33E2	33	9/9-33E2	0	27	0.0	8.2	yellow clay	Clay	--	--	--	Qal
33	9/9-33E2			27	53	8.2	16.2	gravel and coarse sand	Gravel	--	--	--	
33	9/9-33E2			53	66	16.2	20.1	gravel	Gravel	--	--	--	
34	8/9-19K1	34	8/9-19K1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Qal
34	8/9-19K1			4	25	1.2	7.6	clay, brown	Clay	--	--	--	
34	8/9-19K1			25	62	7.6	18.9	blue clay and sand	Clay and sand (or sandstone)	--	--	--	
34	8/9-19K1			62	63	18.9	19.2	gravel	Gravel	--	--	--	
34	8/9-19K1			63	64	19.2	19.5	serpentine rock	Undifferentiated basement	--	--	--	KJu
35	8/10-20M3	35	8/10-20M3	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Qal
35	8/10-20M3			2	6	0.6	1.8	gravel	Gravel	--	--	--	
35	8/10-20M3			6	30	1.8	9.1	clay, yellow, and gravel	Clay and gravel	--	--	--	
35	8/10-20M3			30	47	9.1	14.3	gravel	Gravel	--	--	--	
35	8/10-20M3			47	50	14.3	15.2	clay, blue, soft	Clay	--	--	--	
35	8/10-20M3			50	55	15.2	16.8	gravel	Gravel	--	--	--	
35	8/10-20M3			55	59	16.8	18.0	redwood log	Clay and sand (or sandstone)	--	--	wood	
35	8/10-20M3			59	65	18.0	19.8	mud, blue	Clay and sand (or sandstone)	--	--	--	
35	8/10-20M3			65	84	19.8	25.6	clay, blue, soft	Clay	--	--	--	
35	8/10-20M3			84	110	25.6	33.5	clay, yellow, soft, and gravel	Clay and gravel	--	--	--	
35	8/10-20M3			110	120	33.5	36.6	gravel	Gravel	--	--	--	
35	8/10-20M3			120	123	36.6	37.5	clay, yellow and gravel	Clay and gravel	--	--	--	
36	8/10-29D1	36	8/10-29D1	0	30	0.0	9.1	sand	Sand	--	--	--	Qal
36	8/10-29D1			30	120	9.1	36.6	gravel	Gravel	--	--	--	
36	8/10-29D1			120	183	36.6	55.8	basalt	Undifferentiated basement	--	--	--	KJu
37	8/10-29H2	37	8/10-29H2	0	23	0.0	7.0	top clay and sand	Sand and clay	--	--	--	Qal
37	8/10-29H2			23	28	7.0	8.5	top clay and sand	Sand and clay	--	--	--	
37	8/10-29H2			28	48	8.5	14.6	gravel	Gravel	--	--	--	
37	8/10-29H2			48	56	14.6	17.1	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
37	8/10-29H2			56	70	17.1	21.3	fine gravel	Gravel	--	--	--	
37	8/10-29H2			70	74	21.3	22.6	coarse gravel	Gravel	--	--	--	
37	8/10-29H2			74	76	22.6	23.2	fine gravel	Gravel	--	--	--	
37	8/10-29H2			76	107	23.2	32.6	gravel	Gravel	--	--	--	
37	8/10-29H2			107	111	32.6	33.8	fine gravel	Gravel	--	--	--	
37	8/10-29H2			111	115	33.8	35.1	sand gravel	Sand (or sandstone) and gravel	--	--	--	
37	8/10-29H2			115	125	35.1	38.1	gray shale and gravel (reported by observer to be bedrock)	Undifferentiated basement	cemented	--	--	KJu
38	8/10-29N1	38	8/10-29N1	0	12	0.0	3.7	sandy yellow loam	Sand and clay	--	--	--	Qal
38	8/10-29N1			12	18	3.7	5.5	blue clay	Clay	--	--	--	
38	8/10-29N1			18	30	5.5	9.1	gravel	Gravel	--	--	--	
38	8/10-29N1			30	35	9.1	10.7	blue clay	Clay	--	--	--	
38	8/10-29N1			35	40	10.7	12.2	yellow clay	Clay	--	--	--	
38	8/10-29N1			40	43	12.2	13.1	blue clay	Clay	--	--	--	
38	8/10-29N1			43	72	13.1	21.9	green clay	Clay	--	--	--	
38	8/10-29N1			72	75	21.9	22.9	blue sand	Sand	--	--	--	
38	8/10-29N1			75	79	22.9	24.1	blue sand and clay	Sand and clay	--	--	--	
38	8/10-29N1			79	88	24.1	26.8	blue sand and gravel	Sand (or sandstone) and gravel	--	--	--	
38	8/10-29N1			88	90	26.8	27.4	blue sand	Sand	--	--	--	
39	8/9-31A1	39	8/9-31A1	0	4	0.0	1.2	black loam	Sand and clay	--	--	--	Qt
39	8/9-31A1			4	17	1.2	5.2	yellow clay	Clay	--	--	--	
39	8/9-31A1			17	20	5.2	6.1	yellow sand and gravel	Sand (or sandstone) and gravel	--	--	--	
39	8/9-31A1			20	30	6.1	9.1	gravel	Gravel	--	--	--	
39	8/9-31A1			30	34	9.1	10.4	yellow sand and gravel	Sand (or sandstone) and gravel	--	--	--	
39	8/9-31A1			34	72	10.4	21.9	black sandy clay	Clay and sand (or sandstone)	--	--	--	
39	8/9-31A1			72	74	21.9	22.6	blue sand and clay	Sand and clay	--	--	--	QTm
39	8/9-31A1			74	110	22.6	33.5	blue sandy clay	Clay and sand (or sandstone)	--	--	--	
39	8/9-31A1			110	130	33.5	39.6	blue sand	Sand	--	--	--	
39	8/9-31A1			130	235	39.6	71.6	blue sandstone	Sandstone	cemented	--	--	

**Appendix 3. Lithologic data. —Continued**

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
39	8/9-31A1			235	260	71.6	79.2	blue clay	Clay	--	--	--	
39	8/9-31A1			260	325	79.2	99.1	blue sandstone	Sandstone	cemented	--	--	
40	8/9-32E3	40	8/9-32E3	0	3	0.0	0.9	black loam	Sand and clay	--	--	--	Qt
40	8/9-32E3			3	31	0.9	9.4	river silt, brown	Sand and clay	--	--	--	
40	8/9-32E3			31	37	9.4	11.3	yellow sand and gravel	Sand (or sandstone) and gravel	--	--	--	
40	8/9-32E3			37	43	11.3	13.1	yellow clay and gravel	Clay and gravel	--	--	--	
40	8/9-32E3			43	56	13.1	17.1	yellow clay	Clay	--	--	--	
40	8/9-32E3			56	60	17.1	18.3	black sand and clay	Sand and clay	--	--	--	
40	8/9-32E3			60	83	18.3	25.3	blue sandstone	Sandstone	cemented	--	--	QTm
41	7/10-7D1	41	7/10-7D1	0	27	0.0	8.2	clay and sand	Clay and sand (or sandstone)	--	--	--	Qal
41	7/10-7D1			27	40	8.2	12.2	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
41	7/10-7D1			40	55	12.2	16.8	gravel	Gravel	--	--	--	
41	7/10-7D1			55	67	16.8	20.4	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
41	7/10-7D1			67	71	20.4	21.6	gravel	Gravel	--	--	--	
41	7/10-7D1			71	80	21.6	24.4	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
41	7/10-7D1			80	84	24.4	25.6	gravel	Gravel	--	--	--	
41	7/10-7D1			84	94	25.6	28.7	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
41	7/10-7D1			94	120	28.7	36.6	coarse gravel	Gravel	--	--	--	
42	7/11-11J1	42	7/11-11J1	0	3	0.0	0.9	surface	Sand and clay	--	--	--	Qal
42	7/11-11J1			3	102	0.9	31.1	sand	Sand	--	--	--	
42	7/11-11J1			102	107	31.1	32.6	boulders and yellow clay	Clay and gravel	--	--	--	
42	7/11-11J1			107	136	32.6	41.5	gravel, free	Gravel	--	--	--	
43	7/11-17J1	43	7/11-17J1	0	146	0.0	44.5	blue clay and gravel	Clay and gravel	--	--	--	Qal
43	7/11-17J1			146	148	44.5	45.1	serpentine	Undifferentiated basement	--	--	--	KJu
44	8/9-1M1	44	8/9-1M1	0	6	0.0	1.8	surface soil	Sand and clay	--	--	--	QTge
44	8/9-1M1			6	90	1.8	27.4	yellow clay	Clay	--	--	--	
44	8/9-1M1			90	95	27.4	29.0	gravel, first water	Gravel	--	--	--	
44	8/9-1M1			95	162	29.0	49.4	yellow clay	Clay	--	--	--	
44	8/9-1M1			162	250	49.4	76.2	blue clay	Clay	--	--	--	
44	8/9-1M1			250	252	76.2	76.8	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
44	8/9-1M1			252	261	76.8	79.6	blue clay	Clay	--	--	--	
44	8/9-1M1			261	262	79.6	79.9	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
44	8/9-1M1			262	281	79.9	85.6	blue clay	Clay	--	--	--	
44	8/9-1M1			281	282	85.6	86.0	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
44	8/9-1M1			282	298	86.0	90.8	blue clay	Clay	--	--	--	
44	8/9-1M1			298	300	90.8	91.4	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
44	8/9-1M1			300	315	91.4	96.0	blue clay	Clay	--	--	--	
45	8/9-3P1	45	8/9-3P1	0	10	0.0	3.0	black soil	Sand and clay	--	--	--	Qyal
45	8/9-3P1			10	20	3.0	6.1	hardpan, yellow	Clay and gravel	hard	--	--	QTge
45	8/9-3P1			20	35	6.1	10.7	yellow clay	Clay	--	--	--	
45	8/9-3P1			35	40	10.7	12.2	yellow sand and gravel	Sand (or sandstone) and gravel	--	--	--	
45	8/9-3P1			40	52	12.2	15.8	yellow gravel	Sand (or sandstone) and gravel	--	--	--	
45	8/9-3P1			52	74	15.8	22.6	blue sandy clay	Clay and sand (or sandstone)	--	--	--	
45	8/9-3P1			74	85	22.6	25.9	gravel and clay	Clay and gravel	--	--	--	
45	8/9-3P1			85	90	25.9	27.4	blue sand	Sand	--	--	--	
45	8/9-3P1			90	118	27.4	36.0	blue clay	Clay	--	--	--	
46	8/9-9H1	46	8/9-9H1	0	2	0.0	0.6	surface soil	Sand and clay	--	--	--	Qyal
46	8/9-9H1			2	38	0.6	11.6	loose yellow sand and gravel	Sand (or sandstone) and gravel	--	--	--	
46	8/9-9H1			38	40	11.6	12.2	hard yellow cemented gravel	Gravel	cemented	--	--	Qoal and QTge
47	8/9-10R1	47	8/9-10R1	0	400	0.0	121.9	no data	No data	--	--	--	QTge
48	8/9-11P1	48	8/9-11P1	0	4	0.0	1.2	topsoil	Sand and clay	--	--	--	QTge
48	8/9-11P1			4	12	1.2	3.7	gravel	Gravel	--	--	--	
48	8/9-11P1			12	40	3.7	12.2	blue clay	Clay	--	--	--	
48	8/9-11P1			40	150	12.2	45.7	gravel	Gravel	--	--	--	
49	8/9-15D1	49	8/9-15D1	0	12	0.0	3.7	topsoil	Sand and clay	--	--	--	Qyal and QTge (?)
49	8/9-15D1			12	21	3.7	6.4	sand, fine	Sand	--	--	--	
49	8/9-15D1			21	29	6.4	8.8	gravel and sand	Sand (or sandstone) and gravel	--	--	--	
49	8/9-15D1			29	37	8.8	11.3	grave, coarse	Gravel	--	--	--	
49	8/9-15D1			37	48	11.3	14.6	clay	Clay	--	--	--	
49	8/9-15D1			48	63	14.6	19.2	sticky clay, blue	Clay	--	--	--	
49	8/9-15D1			63	66	19.2	20.1	pea gravel	Gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
49	8/9-15D1			66	87	20.1	26.5	pure blue gumbo, tight	Clay	--	--	--	
49	8/9-15D1			87	120	26.5	36.6	quicksand, tight, packed	Sand and clay	--	--	--	
49	8/9-15D1			120	126	36.6	38.4	clay	Clay	--	--	--	
49	8/9-15D1			126	133	38.4	40.5	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
49	8/9-15D1			133	134	40.5	40.8	hard clay	Clay	hard	--	--	
50	8/9-13C1	50	8/9-13C1	0	15	0.0	4.6	yellow clay	Clay	--	--	--	Qyal and QTge
50	8/9-13C1			15	21	4.6	6.4	gravel	Gravel	--	--	--	
50	8/9-13C1			21	65	6.4	19.8	yellow clay	Clay	--	--	--	
50	8/9-13C1			65	170	19.8	51.8	yellow clay and gravel	Clay and gravel	--	--	--	
50	8/9-13C1			170	197	51.8	60.0	gravel	Gravel	--	--	--	
50	8/9-13C1			197	202	60.0	61.6	yellow clay	Clay	--	--	--	
51	8/9-14L1	51	8/9-14L1	0	53	0.0	16.2	no data	No data	--	--	--	--
51	8/9-14L1			53	58	16.2	17.7	loose gravel	Gravel	--	--	--	QTge
51	8/9-14L1			58	83	17.7	25.3	no data	No data	--	--	--	
51	8/9-14L1			83	89	25.3	27.1	cemented gravel	Gravel	cemented	--	--	
51	8/9-14L1			89	106	27.1	32.3	no data	No data	--	--	--	
51	8/9-14L1			106	109	32.3	33.2	loose gravel	Gravel	--	--	--	
51	8/9-14L1			109	242	33.2	73.8	no data	No data	--	--	--	
51	8/9-14L1			242	253	73.8	77.1	pea gravel	Gravel	--	--	--	
51	8/9-14L1			253	265	77.1	80.8	no data	No data	--	--	--	
52	8/8-17L1	52	8/8-17L1	0	30	0.0	9.1	clay, sandy, and gravel	Clay, sand, and gravel	--	--	--	QTge
52	8/8-17L1			30	62	9.1	18.9	clay, yellow, and gravel	Clay and gravel	--	--	--	
52	8/8-17L1			62	74	18.9	22.6	clay, brown	Clay	--	--	--	
52	8/8-17L1							clay, yellow, and gravel; water at					
52	8/8-17L1			74	156	22.6	47.5	103 feet	Clay and gravel	--	--	--	
52	8/8-17L1			156	170	47.5	51.8	clay, blue	Clay	--	--	--	
52	8/8-17L1			170	222	51.8	67.7	clay, sandy gray, and gravel	Clay, sand, and gravel	--	--	--	
52	8/8-17L1			222	248	67.7	75.6	clay, brown, and gravel	Clay and gravel	--	--	--	
52	8/8-17L1			248	257	75.6	78.3	clay, blue	Clay	--	--	--	
52	8/8-17L1							gravel; top 3 feet good gravel,					
52	8/8-17L1			257	274	78.3	83.5	then clay, then fair gravel	Clay and gravel	--	--	--	
52	8/8-17L1			274	278	83.5	84.7	clay, yellow, and gravel	Clay and gravel	--	--	--	
53	8/9-14P1	53	8/9-14P1	0	11	0.0	3.4	no data	No data	--	--	--	--
53	8/9-14P1			11	16	3.4	4.9	sand and gravel	Sand (or sandstone) and gravel	--	--	--	QTge
53	8/9-14P1			16	19	4.9	5.8	no data	No data	--	--	--	
53	8/9-14P1			19	37	5.8	11.3	large gravel	Gravel	--	--	--	
53	8/9-14P1			37	60	11.3	18.3	no data	No data	--	--	--	
53	8/9-14P1			60	65	18.3	19.8	sand	Sand	--	--	--	
53	8/9-14P1			65	118	19.8	36.0	no data	No data	--	--	--	
53	8/9-14P1			118	120	36.0	36.6	gravel	Gravel	--	--	--	
53	8/9-14P1			120	176	36.6	53.6	no data	No data	--	--	--	
53	8/9-14P1			176	184	53.6	56.1	fine gravel	Gravel	--	--	--	
53	8/9-14P1			184	253	56.1	77.1	no data	No data	--	--	--	
53	8/9-14P1			253	264	77.1	80.5	pea gravel	Gravel	--	--	--	
54	8/9-13N1	54	8/9-13N1	0	6	0.0	1.8	soil	Sand and clay	--	--	--	QTge
54	8/9-13N1			6	14	1.8	4.3	hardpan	Clay and gravel	hard	--	--	
54	8/9-13N1			14	21	4.3	6.4	gravel, water	Gravel	--	--	--	
54	8/9-13N1			21	40	6.4	12.2	gravel	Gravel	--	--	--	
54	8/9-13N1			40	70	12.2	21.3	clay, sandy	Clay and sand (or sandstone)	--	--	--	
54	8/9-13N1			70	74	21.3	22.6	gravel, water	Gravel	--	--	--	
54	8/9-13N1			74	82	22.6	25.0	clay, blue	Clay	--	--	--	
54	8/9-13N1			82	86	25.0	26.2	gravel, water	Gravel	--	--	--	
54	8/9-13N1			86	98	26.2	29.9	clay	Clay	--	--	--	
54	8/9-13N1			98	110	29.9	33.5	sand and gravel, water	Sand (or sandstone) and gravel	--	--	--	
54	8/9-13N1			110	130	33.5	39.6	clay	Clay	--	--	--	
54	8/9-13N1			130	136	39.6	41.5	sand, clay, and gravel; water	Clay, sand, and gravel	--	--	--	
54	8/9-13N1			136	152	41.5	46.3	clay	Clay	--	--	--	
54	8/9-13N1			152	168	46.3	51.2	gravel, water	Gravel	--	--	--	
54	8/9-13N1			168	172	51.2	52.4	clay, blue	Clay	--	--	--	
54	8/9-13N1			172	184	52.4	56.1	gravel, water	Gravel	--	--	--	
54	8/9-13N1			184	208	56.1	63.4	shale, blue	Clay and sand (or sandstone)	cemented	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
55	8/8-20B2	55	8/8-20B2	0	202	0.0	61.6	no data	No data	--	--	--	--
55	8/8-20B2				202	227	61.6	69.2	sand clay and gravel; gravel	--	--	--	QTge
55	8/8-20B2				227	231	69.2	70.4	no data	No data	--	--	--
56	8/8-20D1	56	8/8-20D1	0	260	0.0	79.2	no data	No data	--	--	--	QTge
57	8/9-23G1	57	8/9-23G1	0	18	0.0	5.5	no data	No data	--	--	--	--
57	8/9-23G1				18	28	5.5	8.5	gravel	Gravel	--	--	QTge
57	8/9-23G1				28	37	8.5	11.3	no data	No data	--	--	--
57	8/9-23G1				37	52	11.3	15.8	sand; pea gravel	Sand (or sandstone) and gravel	--	--	--
57	8/9-23G1				52	79	15.8	24.1	no data	No data	--	--	--
57	8/9-23G1				79	95	24.1	29.0	fine gravel	Gravel	--	--	--
57	8/9-23G1				95	128	29.0	39.0	no data	No data	--	--	--
57	8/9-23G1				128	138	39.0	42.1	sand and gravel	Sand (or sandstone) and gravel	--	--	--
57	8/9-23G1				138	200	42.1	61.0	no data	No data	--	--	--
57	8/9-23G1				200	223	61.0	68.0	gravel	Gravel	--	--	--
57	8/9-23G1				223	276	68.0	84.1	no data	No data	--	--	--
57	8/9-23G1				276	280	84.1	85.3	gravel	Gravel	--	--	--
57	8/9-23G1				280	440	85.3	134.1	no data	No data	--	--	--
58	8/9-24E1	58	8/9-24E1	0	330	0.0	100.6	no data	No data	--	--	--	Qyal (?) and QTge
59	8/9-23L1	59	8/9-23L1	0	4	0.0	1.2	topsoil	Sand and clay	--	--	--	QTge
59	8/9-23L1				4	12	1.2	3.7	soil and white clay	Sand and clay	--	--	--
59	8/9-23L1				12	15	3.7	4.6	sand and clay	Sand and clay	--	--	--
59	8/9-23L1				15	25	4.6	7.6	sand, blue	Sand	--	--	--
59	8/9-23L1				25	51	7.6	15.5	coarse gravel	Gravel	--	--	--
59	8/9-23L1				51	56	15.5	17.1	blue clay	Clay	--	--	--
59	8/9-23L1				56	70	17.1	21.3	coarse gravel	Gravel	--	--	--
59	8/9-23L1				70	74	21.3	22.6	blue clay	Clay	--	--	--
59	8/9-23L1				74	85	22.6	25.9	coarse gravel	Gravel	--	--	--
59	8/9-23L1				85	107	25.9	32.6	blue clay, mixed gravel	Clay and gravel	--	--	--
59	8/9-23L1				107	171	32.6	52.1	soft blue clay	Clay	--	--	--
59	8/9-23L1				171	224	52.1	68.3	hard blue shale	Clay and sand (or sandstone)	hard	--	--
59	8/9-23L1				224	306	68.3	93.3	soft blue sandy shale	Clay and sand (or sandstone)	cemented	--	--
59	8/9-23L1				306	351	93.3	107.0	gravel	Gravel	--	--	--
59	8/9-23L1				351	354	107.0	107.9	blue clay	Clay	--	--	--
59	8/9-23L1				354	364	107.9	110.9	blue shale	Clay and sand (or sandstone)	cemented	--	--
59	8/9-23L1				364	376	110.9	114.6	sandy blue clay	Clay and sand (or sandstone)	--	--	--
59	8/9-23L1				376	403	114.6	122.8	coarse sand and washed shale	Clay and sand (or sandstone)	cemented	--	--
59	8/9-23L1				403	429	122.8	130.8	blue clay	Clay	--	--	--
60	8/8-19M1	60	8/8-19M1	0	2	0.0	0.6	fine soil	Sand and clay	--	--	--	QTge
60	8/8-19M1				2	27	0.6	8.2	yellow sandy clay	Clay and sand (or sandstone)	--	--	--
60	8/8-19M1				27	37	8.2	11.3	yellow sand and fine gravel	Sand (or sandstone) and gravel	--	--	--
60	8/8-19M1				37	45	11.3	13.7	coarse packed gravel	Gravel	--	--	--
60	8/8-19M1				45	65	13.7	19.8	yellow sandy clay	Clay and sand (or sandstone)	--	--	--
60	8/8-19M1				65	90	19.8	27.4	coarse gravelly clay	Clay and gravel	--	--	--
60	8/8-19M1				90	115	27.4	35.1	medium packed brown clay	Clay	--	--	--
60	8/8-19M1				115	130	35.1	39.6	small boulders	Gravel	--	--	--
60	8/8-19M1				130	160	39.6	48.8	yellow clay and fine gravel	Clay and gravel	--	--	--
60	8/8-19M1				160	185	48.8	56.4	fine gravel and brown sand	Sand (or sandstone) and gravel	--	--	--
60	8/8-19M1				185	205	56.4	62.5	small gravelly brown clay	Clay and gravel	--	--	--
60	8/8-19M1				205	235	62.5	71.6	coarse packed brown gravel	Gravel	--	--	--
60	8/8-19M1				235	255	71.6	77.7	medium brown gravel	Gravel	--	--	--
60	8/8-19M1				255	260	77.7	79.2	large packed gravel	Gravel	--	--	--
61	8/8-19N1	61	8/8-19N1	0	27	0.0	8.2	no data	No data	--	--	--	--
61	8/8-19N1				27	45	8.2	13.7	packed fine sandy gravel; coarse packed gravel	Sand (or sandstone) and gravel	--	--	QTge
61	8/8-19N1				45	105	13.7	32.0	no data	No data	--	--	--
61	8/8-19N1				105	120	32.0	36.6	"small bouldery" sand	Sand (or sandstone) and gravel	--	--	--
61	8/8-19N1				120	150	36.6	45.7	no data	No data	--	--	--
61	8/8-19N1				150	175	45.7	53.3	fine gravel and coarse sand	Sand (or sandstone) and gravel	--	--	--
61	8/8-19N1				175	200	53.3	61.0	no data	No data	--	--	--
61	8/8-19N1				200	249	61.0	75.9	packed coarse gravelly sand	Sand (or sandstone) and gravel	--	--	--
62	8/8-20Q1	62	8/8-20Q1	0	10	0.0	3.0	topsoil	Sand and clay	--	--	--	Qyal

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
62	8/8-20Q1			10	20	3.0	6.1	yellow clay	Clay	--	--	--	QTge
62	8/8-20Q1			20	122	6.1	37.2	gravel and some clay	Sand (or sandstone) and gravel	--	--	--	
62	8/8-20Q1			122	237	37.2	72.2	gravel and sand	Sand (or sandstone) and gravel	--	--	--	
62	8/8-20Q1			237	295	72.2	89.9	gravel	Gravel	--	--	--	
62	8/8-20Q1			295	308	89.9	93.9	yellow clay	Clay	--	--	--	
62	8/8-20Q1			308	312	93.9	95.1	boulders and clay	Clay and gravel	--	--	--	
63	8/9-26D1	63	8/9-26D1	0	240	0.0	73.2	no data	No data	--	--	--	--
63	8/9-26D1			240	280	73.2	85.3	sandy clay and gravel; gravel	Clay, sand, and gravel	--	--	--	QTge
63	8/9-26D1			280	394	85.3	120.1	no data	No data	--	--	--	
63	8/9-26D1			394	462	120.1	140.8	clay and gravel; gravel	Clay and gravel	--	--	--	
63	8/9-26D1			462	464	140.8	141.4	no data	No data	--	--	--	
64	8/8-29C1	64	8/8-29C1	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Qyal and QTge
64	8/8-29C1			2	20	0.6	6.1	yellow clay	Clay	--	--	--	
64	8/8-29C1			20	25	6.1	7.6	blue clay	Clay	--	--	--	
64	8/8-29C1			25	60	7.6	18.3	yellow clay	Clay	--	--	--	
64	8/8-29C1			60	68	18.3	20.7	gravel	Gravel	--	--	--	
65	8/8-29D1	65	8/8-29D1	0	24	0.0	7.3	sandy blue clay	Clay and sand (or sandstone)	--	--	--	Qyal and QTge
65	8/8-29D1			24	50	7.3	15.2	sandy red clay	Clay and sand (or sandstone)	--	--	--	
65	8/8-29D1			50	56	15.2	17.1	red sand	Sand	--	--	--	
65	8/8-29D1			56	57	17.1	17.4	blue clay	Clay	--	--	--	
66	8/8-30G1	66	8/8-30G1	57	84	17.4	25.6	old well	No data	--	--	--	Qyal and QTge
66	8/8-30G1			84	92	25.6	28.0	yellow gravel	Gravel	--	--	--	
66	8/8-30G1			92	110	28.0	33.5	yellow clay	Clay	--	--	--	
66	8/8-30G1			110	115	33.5	35.1	yellow gravel	Gravel	--	--	--	
66	8/8-30G1			115	122	35.1	37.2	gray clay	Clay	--	--	--	
66	8/8-30G1			122	140	37.2	42.7	yellow sand and gravel	Sand (or sandstone) and gravel	--	--	--	
67	8/8-30L1	67	8/8-30L1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	QTge
67	8/8-30L1			3	17	0.9	5.2	hardpan	Sand and gravel	hard	--	--	
67	8/8-30L1			17	43	5.2	13.1	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
67	8/8-30L1			43	90	13.1	27.4	clay, yellow	Clay	--	--	--	
67	8/8-30L1			90	107	27.4	32.6	clay, yellow, and gravel	Clay and gravel	--	--	--	
67	8/8-30L1			107	124	32.6	37.8	gravel	Gravel	--	--	--	
67	8/8-30L1			124	135	37.8	41.1	clay, blue, and gravel	Clay and gravel	--	--	--	
67	8/8-30L1							gravel, coarse, blue, and some					
67	8/8-30L1			135	145	41.1	44.2	clay	Sand (or sandstone) and gravel	--	--	--	
67	8/8-30L1			145	188	44.2	57.3	gravel and clay	Sand (or sandstone) and gravel	--	--	--	
67	8/8-30L1			188	204	57.3	62.2	clay, blue	Clay	--	--	--	
67	8/8-30L1			204	245	62.2	74.7	clay, yellow, and gravel	Clay and gravel	--	--	--	
67	8/8-30L1			245	268	74.7	81.7	clay, sandy, yellow, and gravel	Sand (or sandstone) and gravel	--	--	--	
67	8/8-30L1			268	285	81.7	86.9	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
67	8/8-30L1			285	325	86.9	99.1	clay, blue and gravel	Clay and gravel	--	--	--	
67	8/8-30L1			325	340	99.1	103.6	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
67	8/8-30L1			340	345	103.6	105.2	clay, blue, and gravel	Clay and gravel	--	--	--	
67	8/8-30L1			345	375	105.2	114.3	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
67	8/8-30L1			375	463	114.3	141.1	clay, sandy, blue, and gravel	Clay, sand, and gravel	--	--	--	
68	8/9-27K1	68	8/9-27K1	0	6	0.0	1.8	soil	Sand and clay	--	--	--	Qyal
68	8/9-27K1			6	50	1.8	15.2	clay hard, yellow	Clay	hard	--	--	QTge and QTm
68	8/9-27K1			50	52	15.2	15.8	sand and gravel, water	Sand (or sandstone) and gravel	--	--	--	
68	8/9-27K1			52	303	15.8	92.4	blue clay	Clay	--	--	--	
68	8/9-27K1			303	333	92.4	101.5	gravel and clam shells, water	Gravel	--	shells	--	
69	8/8-30N1	69	8/8-30N1	0	2	0.0	0.6	soil	Sand and clay	--	--	--	QTge
69	8/8-30N1			2	19	0.6	5.8	hardpan	Clay and gravel	hard	--	--	
69	8/8-30N1			19	21	5.8	6.4	clay yellow	Clay	--	--	--	
69	8/8-30N1			21	40	6.4	12.2	clay, yellow, and gravel	Clay and gravel	--	--	--	
69	8/8-30N1			40	60	12.2	18.3	clay, yellow	Clay	--	--	--	
69	8/8-30N1			60	95	18.3	29.0	clay, yellow, and gravel	Clay and gravel	--	--	--	
69	8/8-30N1			95	98	29.0	29.9	clay, blue, and gravel	Clay and gravel	--	--	--	
69	8/8-30N1			98	115	29.9	35.1	clay, blue	Clay	--	--	--	
69	8/8-30N1			115	119	35.1	36.3	clay, yellow, and gravel	Clay and gravel	--	--	--	
69	8/8-30N1			119	125	36.3	38.1	gravel	Gravel	--	--	--	
69	8/8-30N1			125	185	38.1	56.4	gravel and clay	Sand (or sandstone) and gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
69	8/8-30N1			185	223	56.4	68.0	gravel and clay, yellow	Clay and gravel	--	--	--	
69	8/8-30N1			223	231	68.0	70.4	clay, blue	Clay	--	--	--	
69	8/8-30N1			231	239	70.4	72.8	gravel, cemented	Gravel	cemented	--	--	
69	8/8-30N1			239	253	72.8	77.1	clay, blue	Clay	--	--	--	
69	8/8-30N1			253	330	77.1	100.6	gravel and clay, blue	Clay and gravel	--	--	--	
69	8/8-30N1			330	350	100.6	106.7	clay, sandy, and gravel	Clay, sand, and gravel	--	--	--	
69	8/8-30N1			350	405	106.7	123.4	clay, blue	Clay	--	--	--	
69	8/8-30N1			405	410	123.4	125.0	clay, sandy, blue, and gravel	Clay, sand, and gravel	--	--	--	
69	8/8-30N1			410	450	125.0	137.2	clay and gravel	Clay and gravel	--	--	--	
69	8/8-30N1			450	455	137.2	138.7	clay, blue	Clay	--	--	--	
70	8/8-30N2	70	8/8-30N2	0	4	0.0	1.2	soil	Sand and clay	--	--	--	QTge
70	8/8-30N2			4	55	1.2	16.8	clay, yellow, and gravel	Clay and gravel	--	--	--	
70	8/8-30N2			55	62	16.8	18.9	clay, sandy yellow	Sand and clay	--	--	--	
70	8/8-30N2			62	175	18.9	53.3	clay and gravel	Clay and gravel	--	--	--	
70	8/8-30N2			175	177	53.3	53.9	clay, blue	Clay	--	--	--	
70	8/8-30N2			177	183	53.9	55.8	gravel	Gravel	--	--	--	
70	8/8-30N2			183	190	55.8	57.9	clay, blue	Clay	--	--	--	
70	8/8-30N2			190	260	57.9	79.2	clay, blue and gravel	Clay and gravel	--	--	--	
70	8/8-30N2			260	283	79.2	86.3	clay, sandy, blue and gravel	Clay, sand, and gravel	--	--	--	
70	8/8-30N2			283	340	86.3	103.6	clay, blue, and gravel	Clay and gravel	--	--	--	
70	8/8-30N2			340	348	103.6	106.1	clay, blue and coarse gravel	Clay and gravel	--	--	--	
70	8/8-30N2			348	375	106.1	114.3	clay, blue, and gravel	Clay and gravel	--	--	--	
70	8/8-30N2			375	390	114.3	118.9	clay, yellow, and gravel	Clay and gravel	--	--	--	
70	8/8-30N2			390	425	118.9	129.5	clay, blue	Clay	--	--	--	
70	8/8-30N2			425	430	129.5	131.1	clay, blue, and gravel	Clay and gravel	--	--	--	
70	8/8-30N2			430	436	131.1	132.9	clay, sandy, blue	Clay, sand, and gravel	--	--	--	
70	8/8-30N2			436	580	132.9	176.8	clay, blue	Clay	--	--	--	
70	8/8-30N2			580	585	176.8	178.3	clay, blue, and some gravel	Clay and gravel	--	--	--	
70	8/8-30N2			585	600	178.3	182.9	clay, blue	Clay	--	--	--	
71	8/8-31B1	71	8/8-31B1	0	118	0.0	36.0	no data	No data	--	--	--	--
71	8/8-31B1			118	206	36.0	62.8	gravel; clay and gravel	Sand (or sandstone) and gravel	--	--	--	QTge
71	8/8-31B1			206	210	62.8	64.0	no data	No data	--	--	--	
72	8/9-33G1	72	8/9-33G1	0	358	0.0	109.1	(Untested hole)	No data	--	--	--	
73	8/9-36G1	73	8/9-36G1	0	642	0.0	195.7	no data	No data	--	--	--	QTge and QTm
74	8/9-36K1	74	8/9-36K1	0	1325	0.0	403.9	no data	No data	--	--	--	--
75	8/9-36L1	75	8/9-36L1	0	27	0.0	8.2	blue clay	Clay	--	--	--	Qyal
75	8/9-36L1			27	33	8.2	10.1	gravel	Gravel	--	--	--	
75	8/9-36L1			33	430	10.1	131.1	blue clay	Clay	--	--	--	QTge
75	8/9-36L1			430	455	131.1	138.7	gravel	Gravel	--	--	--	
75	8/9-36L1			455	520	138.7	158.5	blue clay	Clay	--	--	--	
75	8/9-36L1			520	535	158.5	163.1	gravel	Gravel	--	--	--	
75	8/9-36L1			535	565	163.1	172.2	blue clay	Clay	--	--	--	
76	8/9-33J1	76	8/9-33J1	0	7	0.0	2.1	adobe	Sand and clay	--	--	--	Qyal
76	8/9-33J1			7	20	2.1	6.1	hardpan	Clay and gravel	hard	--	--	QTm
76	8/9-33J1			20	55	6.1	16.8	clay, sandy water	Clay and sand (or sandstone)	--	--	--	
76	8/9-33J1			55	62	16.8	18.9	blue clay	Clay	--	--	--	
76	8/9-33J1			62	71	18.9	21.6	gravel water	Gravel	--	--	--	
76	8/9-33J1			71	101	21.6	30.8	blue clay and gravel, hard	Clay and gravel	hard	--	--	
76	8/9-33J1			101	106	30.8	32.3	blue clay and gravel	Clay and gravel	--	--	--	
76	8/9-33J1			106	129	32.3	39.3	yellow clay and gravel	Clay and gravel	--	--	--	
76	8/9-33J1			129	150	39.3	45.7	blue clay and gravel	Clay and gravel	--	--	--	
76	8/9-33J1			150	156	45.7	47.5	decomposed brown rock	Ash or tuff	--	--	--	
76	8/9-33J1			156	190	47.5	57.9	decomposed rock	Ash or tuff	--	--	--	
76	8/9-33J1			190	195	57.9	59.4	yellow clay	Clay	--	--	--	
76	8/9-33J1			195	220	59.4	67.1	blue clay and gravel	Clay and gravel	--	--	--	
76	8/9-33J1			220	268	67.1	81.7	cemented gravel	Gravel	cemented	--	--	
76	8/9-33J1			268	285	81.7	86.9	cemented gravel, hard	Gravel	cemented	--	--	
76	8/9-33J1			285	325	86.9	99.1	hard rock and shale	Clay, sand, and gravel	hard	--	--	KJu
77	8/9-35M1	77	8/9-35M1	0	475	0.0	144.8	no data	No data	--	--	--	Qyal and QTge and QTm
78	8/9-35K1	78	8/9-35K1	0	28	0.0	8.5	clay, yellow	Clay	--	--	--	QTge
78	8/9-35K1			28	33	8.5	10.1	clay, blue	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
78	8/9-35K1			33	37	10.1	11.3	sand, blue, and gravel	Sand (or sandstone) and gravel	--	--	--	
78	8/9-35K1			37	50	11.3	15.2	clay, blue	Clay	--	--	--	
78	8/9-35K1			50	72	15.2	21.9	gravel, cement; water and gas	Gravel	cemented	--	--	
78	8/9-35K1			72	104	21.9	31.7	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
78	8/9-35K1			104	106	31.7	32.3	gravel, cement	Gravel	cemented	--	--	
78	8/9-35K1			106	128	32.3	39.0	clay, blue	Clay	--	--	--	
78	8/9-35K1			128	140	39.0	42.7	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
78	8/9-35K1			140	160	42.7	48.8	clay, tough, blue	Clay	--	--	--	
78	8/9-35K1			160	198	48.8	60.4	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
78	8/9-35K1			198	208	60.4	63.4	gravel, cement	Gravel	cemented	--	--	
78	8/9-35K1			208	211	63.4	64.3	clay, blue	Clay	--	--	--	
78	8/9-35K1			211	230	64.3	70.1	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
78	8/9-35K1			230	232	70.1	70.7	gravel, cement	Gravel	cemented	--	--	
78	8/9-35K1			232	236	70.7	71.9	clay, blue	Clay	--	--	--	QTm
78	8/9-35K1			236	240	71.9	73.2	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
78	8/9-35K1			240	268	73.2	81.7	clay, blue	Clay	--	--	--	
78	8/9-35K1			268	270	81.7	82.3	sandstone	Sandstone	cemented	--	--	
78	8/9-35K1			270	280	82.3	85.3	clay, blue, and gravel	Clay and gravel	--	--	--	
78	8/9-35K1			280	320	85.3	97.5	sandstone	Sandstone	cemented	--	--	
78	8/9-35K1			320	352	97.5	107.3	clay, blue, tough	Clay	--	--	--	
78	8/9-35K1			352	360	107.3	109.7	clay, blue, soft	Clay	--	--	--	
78	8/9-35K1			360	362	109.7	110.3	gravel, cement	Gravel	cemented	--	--	
78	8/9-35K1			362	378	110.3	115.2	clay, blue, soft	Clay	--	--	--	
78	8/9-35K1			378	389	115.2	118.6	sandstone	Sandstone	cemented	--	--	
78	8/9-35K1			389	398	118.6	121.3	clay, soft, blue	Clay	--	--	--	
78	8/9-35K1			398	410	121.3	125.0	gravel, cement	Gravel	cemented	--	--	
78	8/9-35K1			410	425	125.0	129.5	sandstone	Sandstone	cemented	--	--	
78	8/9-35K1			425	434	129.5	132.3	clay, blue	Clay	--	--	--	
78	8/9-35K1			434	442	132.3	134.7	clay, soft, blue	Clay	--	--	--	
78	8/9-35K1			442	462	134.7	140.8	sandstone	Sandstone	cemented	--	--	
78	8/9-35K1			462	465	140.8	141.7	clay, soft, blue	Clay	--	--	--	
78	8/9-35K1			465	473	141.7	144.2	sandstone, hard	Sandstone	hard	--	--	
78	8/9-35K1			473	490	144.2	149.4	gravel, cement	Gravel	cemented	--	--	
78	8/9-35K1			490	496	149.4	151.2	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
78	8/9-35K1			496	498	151.2	151.8	clay, blue	Clay	--	--	--	
79	8/9-34R1	79	8/9-34R1	0	260	0.0	79.2	clay, blue and yellow; contains gravel	Clay and gravel	--	--	--	Qyal and QTge (?)
79	8/9-34R1			260	320	79.2	97.5	clean sand and gravel, clam and snail shells	Sand (or sandstone) and gravel	--	shells	--	QTm
79	8/9-34R1			320	357	97.5	108.8	fine sand; includes shells	Sand	--	shells	--	
79	8/9-34R1			357	360	108.8	109.7	clay	Clay	--	--	--	
80	8/8-34Q1	80	8/8-34Q1	0	285	0.0	86.9	no data	No data	--	--	--	QTge
81	8/9-36P1	81	8/9-36P1	0	9	0.0	2.7	soil	Sand and clay	--	--	--	Qyal
81	8/9-36P1			9	50	2.7	15.2	clay, blue	Clay	--	--	--	
81	8/9-36P1			50	57	15.2	17.4	yellow	Clay	--	--	--	
81	8/9-36P1			57	62	17.4	18.9	gravel	Gravel	--	--	--	
81	8/9-36P1			62	80	18.9	24.4	clay, yellow	Clay	--	--	--	QTge
81	8/9-36P1			80	141	24.4	43.0	clay, blue	Clay	--	--	--	
81	8/9-36P1			141	147	43.0	44.8	pea gravel	Gravel	--	--	--	
81	8/9-36P1			147	210	44.8	64.0	clay blue	Clay	--	--	--	
81	8/9-36P1			210	217	64.0	66.1	clay, yellow	Clay	--	--	--	
81	8/9-36P1			217	455	66.1	138.7	clay, blue	Clay	--	--	--	
81	8/9-36P1			455	463	138.7	141.1	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
81	8/9-36P1			463	631	141.1	192.3	clay blue	Clay	--	--	--	
81	8/9-36P1			631	650	192.3	198.1	clay, blue sandy	Clay and sand (or sandstone)	--	--	--	
81	8/9-36P1			650	678	198.1	206.7	clay, sandy	Clay and sand (or sandstone)	--	--	--	
81	8/9-36P1			678	711	206.7	216.7	clay, blue	Clay	--	--	--	
81	8/9-36P1			711	730	216.7	222.5	sand, coarse, and pea gravel	Sand (or sandstone) and gravel	--	--	--	
81	8/9-36P1			730	765	222.5	233.2	clay, blue	Clay	--	--	--	QTm
81	8/9-36P1			765	804	233.2	245.1	sand, gray	Sand	--	--	--	
81	8/9-36P1			804	808	245.1	246.3	clay, blue	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>	
81	8/9-36P1			808	835	246.3	254.5	clay, sandy	Clay and sand (or sandstone)	--	--	--		
81	8/9-36P1				835	850	254.5	259.1	clay, blue	Clay	--	--	--	
81	8/9-36P1				850	880	259.1	268.2	sand, gray; sand running bad	Sand	--	--	--	
81	8/9-36P1				880	910	268.2	277.4	clay, blue	Clay	--	--	--	
81	8/9-36P1				910	994	277.4	303.0	gravel	Gravel	--	--	--	
81	8/9-36P1				994	1005	303.0	306.3	sand	Sand	--	--	QTge	
81	8/9-36P1			1005	1010	306.3	307.8	sand and clam shells	Sand	--	shells	--	QTm	
81	8/9-36P1			1010	1020	307.8	310.9	clay, blue	Clay	--	--	--		
								basalt(?) probably dark massive well-cemented fine-grained						
81	8/9-36P1				1020	1025	310.9	312.4	sandstone	Basalt	hard	--	--	
81	8/9-36P1					1025	1048	312.4	fossil formation	Clay and sand (or sandstone)	--	fossils (?)	--	
81	8/9-36P1					1048	1050	319.4	Petaluma Valley	Clay and sand (or sandstone)	--	--	--	
82	7/9-2C1	82	7/9-2C1	0	610	0.0	185.9	no data	No data	--	--	--	Qyal and QTge and QTm	
83	8/9-34R2	83	8/9-34R2	0	20	0.0	6.1	topsoil	Sand and clay	--	--	--	Qyal and QTge (?)	
83	8/9-34R2				20	36	6.1	11.0	topsoil	Sand and clay	--	--	--	
83	8/9-34R2				36	70	11.0	21.3	pea gravel	Gravel	--	--	--	
83	8/9-34R2				70	108	21.3	32.9	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
83	8/9-34R2				108	118	32.9	36.0	clay, yellow	Clay	--	--	--	
83	8/9-34R2				118	128	36.0	39.0	gravel, small	Gravel	--	--	--	
83	8/9-34R2				128	155	39.0	47.2	mixed clay and small gravel	Gravel	--	--	--	
83	8/9-34R2				155	159	47.2	48.5	gravel, small, and tules	Gravel	--	--	tule	
83	8/9-34R2				159	190	48.5	57.9	clay, sandy	Clay and sand (or sandstone)	--	--	--	
83	8/9-34R2				190	210	57.9	64.0	sand, fine	Sand	--	--	QTm	
83	8/9-34R2				210	230	64.0	70.1	sand and tules	Sand	--	--	tule	
83	8/9-34R2				230	260	70.1	79.2	gravel, small	Gravel	--	--	--	
83	8/9-34R2				260	280	79.2	85.3	gravel, pea	Gravel	--	--	--	
83	8/9-34R2				280	300	85.3	91.4	gravel, small, and tules	Gravel	--	--	tule	
83	8/9-34R2				300	340	91.4	103.6	shells and gravel	Sand (or sandstone) and gravel	--	shells	--	
83	8/9-34R2				340	350	103.6	106.7	shells	Sand	--	shells	--	
83	8/9-34R2				350	410	106.7	125.0	clay, sand, and shells	Clay and sand (or sandstone)	--	shells	--	
83	8/9-34R2				410	485	125.0	147.8	sand, small gravel, and shells	Sand (or sandstone) and gravel	--	shells	--	
83	8/9-34R2				485	491	147.8	149.7	clay, hard, blue	Clay	hard	--	--	
84	7/8-3C1	84	7/8-3C1	0	47	0.0	14.3	no data	No data	--	--	--		
84	7/8-3C1				47	115	14.3	35.1	clay and gravel	Clay and gravel	--	--	QTge	
84	7/8-3C1				115	235	35.1	71.6	no data	No data	--	--	--	
85	7/8-4B3	85	7/8-4B3	0	4	0.0	1.2	topsoil	Sand and clay	--	--	--	Qyal and QTge	
85	7/8-4B3				4	10	1.2	3.0	clay, sand	Clay and sand (or sandstone)	--	--	--	
85	7/8-4B3				10	13	3.0	4.0	clay, yellow, and gravel	Clay and gravel	--	--	--	
85	7/8-4B3				13	25	4.0	7.6	gravel	Gravel	--	--	--	
85	7/8-4B3				25	49	7.6	14.9	gravel, cemented	Gravel	cemented	--	--	
85	7/8-4B3				49	54	14.9	16.5	clay, yellow, and sandy gravel	Clay, sand, and gravel	--	--	--	
85	7/8-4B3				54	70	16.5	21.3	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
85	7/8-4B3				70	85	21.3	25.9	clay, blue	Clay	--	--	--	
85	7/8-4B3				85	95	25.9	29.0	gravel, yellow cemented	Gravel	cemented	--	--	
85	7/8-4B3				95	118	29.0	36.0	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
85	7/8-4B3				118	120	36.0	36.6	sandy, blue, and gravel	Clay, sand, and gravel	--	--	--	
85	7/8-4B3				120	125	36.6	38.1	clay, blue	Clay	--	--	--	
85	7/8-4B3				125	134	38.1	40.8	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
85	7/8-4B3				134	150	40.8	45.7	clay, yellow, and gravel	Clay and gravel	--	--	--	
85	7/8-4B3				150	152	45.7	46.3	gravel, yellow, cemented	Gravel	cemented	--	--	
86	7/7-5F1	86	7/7-5F1	0	2	0.0	0.6	loam, black	Sand and clay	--	--	--	QTge	
86	7/7-5F1				2	4	0.6	1.2	rock	Gravel	hard	--	--	
86	7/7-5F1				4	47	1.2	14.3	clay, yellow, and gravel; water at 12 feet	Clay and gravel	--	--	--	
86	7/7-5F1				47	52	14.3	15.8	gravel	Gravel	--	--	--	
86	7/7-5F1				52	72	15.8	21.9	clay, yellow, and gravel	Clay and gravel	--	--	--	
86	7/7-5F1				72	74	21.9	22.6	gravel, water	Gravel	--	--	--	
86	7/7-5F1				74	97	22.6	29.6	clay, yellow, and gravel	Clay and gravel	--	--	--	
86	7/7-5F1				97	117	29.6	35.7	clay, yellow	Clay	--	--	--	
86	7/7-5F1				117	129	35.7	39.3	clay, yellow, and gravel	Clay and gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
86	7/7-5F1			129	157	39.3	47.9	gravel, water	Gravel	--	--	--	
86	7/7-5F1			157	164	47.9	50.0	clay, yellow, and gravel	Clay and gravel	--	--	--	
87	7/7-5F2	87	7/7-5F2	0	65	0.0	19.8	no data	No data	--	--	--	--
87	7/7-5F2			65	75	19.8	22.9	packed gravel	Gravel	--	--	--	QTge
87	7/7-5F2			160	175	48.8	53.3	medium packed gravel	Gravel	--	--	--	
87	7/7-5F2			175	275	53.3	83.8	no data	No data	--	--	--	
88	7/9-3E1	88	7/9-3E1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	QTm
88	7/9-3E1			4	37	1.2	11.3	yellow clay	Clay	--	--	--	
88	7/9-3E1			37	55	11.3	16.8	blue sandstone	Sandstone	cemented	--	--	
88	7/9-3E1			55	63	16.8	19.2	clam shells, blue	Sand	--	shells	--	
88	7/9-3E1							clam shells and gravel (probably in sand matrix)	Sand (or sandstone) and gravel	--	shells	--	
89	7/7-6G1	89	7/7-6G1	0	3	0.0	0.9	topsoil	Sand and clay	--	--	--	QTge
89	7/7-6G1			3	30	0.9	9.1	fine sand	Sand	--	--	--	
89	7/7-6G1			30	41	9.1	12.5	blue clay with streaks of gravel	Clay and gravel	--	--	--	
89	7/7-6G1			41	87	12.5	26.5	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
89	7/7-6G1			87	108	26.5	32.9	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
89	7/7-6G1			108	124	32.9	37.8	blue clay	Clay	--	--	--	
89	7/7-6G1			124	141	37.8	43.0	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
89	7/7-6G1			141	172	43.0	52.4	blue clay	Clay	--	--	--	
89	7/7-6G1			172	203	52.4	61.9	clay with streaks of gravel	Clay and gravel	--	--	--	
89	7/7-6G1			203	229	61.9	69.8	blue clay	Clay	--	--	--	
89	7/7-6G1			229	243	69.8	74.1	sandy clay	Clay and sand (or sandstone)	--	--	--	
89	7/7-6G1			243	310	74.1	94.5	blue clay	Clay	--	--	--	
89	7/7-6G1			310	333	94.5	101.5	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
89	7/7-6G1			333	338	101.5	103.0	blue clay	Clay	--	--	--	
90	7/8-6H2	90	7/8-6H2	0	2	0.0	0.6	soil	Sand and clay	--	--	--	QTge
90	7/8-6H2			2	8	0.6	2.4	hardpan, gravelly	Clay and gravel	hard	--	--	
90	7/8-6H2			8	26	2.4	7.9	brown clay	Clay	--	--	--	
90	7/8-6H2			26	31	7.9	9.4	loose boulders	Gravel	--	--	--	
90	7/8-6H2			31	60	9.4	18.3	brown sandy clay	Clay and sand (or sandstone)	--	--	--	
90	7/8-6H2			60	82	18.3	25.0	blue sandstone	Sandstone	cemented	--	--	
90	7/8-6H2			82	103	25.0	31.4	blue clay	Clay	--	--	--	
90	7/8-6H2			103	110	31.4	33.5	blue hard clay	Clay	hard	--	--	
90	7/8-6H2			110	125	33.5	38.1	brown and blue clay	Clay	--	--	--	
90	7/8-6H2			125	167	38.1	50.9	gravely clay	Clay and gravel	--	--	--	
90	7/8-6H2			167	232	50.9	70.7	small boulder blue clay	Clay and gravel	--	--	--	
90	7/8-6H2			232	235	70.7	71.6	small loose boulders	Gravel	--	--	--	
90	7/8-6H2			235	275	71.6	83.8	brown clay	Clay	--	--	--	
90	7/8-6H2			275	295	83.8	89.9	blue gravely clay	Clay and gravel	--	--	--	
90	7/8-6H2			295	297	89.9	90.5	gray loose sandstone	Sandstone	cemented	--	--	QTm
90	7/8-6H2			297	330	90.5	100.6	blue hard sandstone	Sandstone	hard	--	--	
90	7/8-6H2			330	342	100.6	104.2	blue clay	Clay	--	--	--	
90	7/8-6H2			342	352	104.2	107.3	gray sandstone	Sandstone	cemented	--	--	QTge
90	7/8-6H2			352	356	107.3	108.5	blue gravely clay	Clay and gravel	--	--	--	
90	7/8-6H2			356	397	108.5	121.0	blue gravely clay	Clay and gravel	--	--	--	
91	7/9-3M1	91	7/9-3M1	0	61	0.0	18.6	old dug well	No data	--	--	--	QTm
91	7/9-3M1			61	72	18.6	21.9	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
91	7/9-3M1			72	78	21.9	23.8	clay, sticky, blue	Clay	--	--	--	
91	7/9-3M1			78	94	23.8	28.7	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
91	7/9-3M1			94	102	28.7	31.1	clay, blue, sticky	Clay	--	--	--	
91	7/9-3M1			102	106	31.1	32.3	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
91	7/9-3M1			106	125	32.3	38.1	sandstone	Sandstone	cemented	--	--	
91	7/9-3M1			125	127	38.1	38.7	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
91	7/9-3M1			127	131	38.7	39.9	gravel	Gravel	--	--	--	
92	7/7-5N1	92	7/7-5N1	0	4	0.0	1.2	soil adobe	Sand and clay	--	--	--	Qyal and QTge (?)
92	7/7-5N1			4	10	1.2	3.0	fine gravel	Gravel	--	--	--	
92	7/7-5N1			10	22	3.0	6.7	boulder and yellow sand	Sand (or sandstone) and gravel	--	--	--	
92	7/7-5N1			22	45	6.7	13.7	sandy yellow clay	Clay and sand (or sandstone)	--	--	--	
92	7/7-5N1			45	55	13.7	16.8	large yellow gravel hardpan	Clay and gravel	hard	--	--	
92	7/7-5N1			55	57	16.8	17.4	brown sand vein	Sand	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>	
92	7/7-5N1			57	72	17.4	21.9	medium gravelly clay	Clay and gravel	--	--	--		
92	7/7-5N1				72	86	21.9	26.2	large brown packed gravel	Gravel	--	--	--	
92	7/7-5N1				86	88	26.2	26.8	brown coarse sand	Sand	--	--	--	
93	7/7-8A1	93	7/7-8A1	0	385	0.0	117.3	no data	No data	--	--	--		
94	7/9-4N1	94	7/9-4N1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	QTge	
94	7/9-4N1				4	30	1.2	9.1	clay and sand, dry	Clay and sand (or sandstone)	--	--	--	QTm
94	7/9-4N1				30	55	9.1	16.8	sand, soft, yellow	Sand	--	--	--	
94	7/9-4N1				55	96	16.8	29.3	sand, soft, blue	Sand	--	--	--	
94	7/9-4N1				96	120	29.3	36.6	sandstone, hard, blue	Sandstone	hard	--	--	
95	7/9-5N1	95	7/9-5N1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	QTm	
95	7/9-5N1				3	68	0.9	20.7	sand, hard yellow	Sand	hard	--	--	
95	7/9-5N1				68	150	20.7	45.7	clay, blue, and sandstone	Clay and sand (or sandstone)	cemented	--	--	
95	7/9-5N1				150	170	45.7	51.8	sandstone, blue	Sandstone	cemented	--	--	
95	7/9-5N1				170	205	51.8	62.5	clay, blue, sand sandstone	Clay and sand (or sandstone)	cemented	--	--	
95	7/9-5N1				205	220	62.5	67.1	sandstone, blue	Sandstone	cemented	--	--	
95	7/9-5N1				220	250	67.1	76.2	clay, blue, and sandstone	Clay and sand (or sandstone)	cemented	--	--	
95	7/9-5N1				250	260	76.2	79.2	sandstone, blue	Sandstone	cemented	--	--	
95	7/9-5N1				260	282	79.2	86.0	clay, blue, and sandstone	Clay and sand (or sandstone)	cemented	--	--	
95	7/9-5N1				282	287	86.0	87.5	clamshells in sandstone	Sandstone	cemented	shells	--	
95	7/9-5N1				287	292	87.5	89.0	bedrock, KJu	Undifferentiated basement	hard	--	--	KJu
96	7/7-9D3	96	7/7-9D3	0	70	0.0	21.3	no data	No data	--	--	--	--	
								sandy clay and gravel; cemented						
96	7/7-9D3				70	130.0	21.3	39.6	gravel	Clay, sand, and gravel	cemented	--	--	QTge
96	7/7-9D3				130.0	241.0	39.6	73.5	no data	No data	--	--		
96	7/7-9D3				241.0	243.0	73.5	74.1	gravel	Gravel	--	--	--	
96	7/7-9D3				243.0	252.0	74.1	76.8	no data	No data	--	--	--	
96	7/7-9D3				252.0	256.0	76.8	78.0	cemented gravel	Gravel	cemented	--	--	
96	7/7-9D3				256.0	271.0	78.0	82.6	no data	No data	--	--	--	
96	7/7-9D3				271.0	275.0	82.6	83.8	sandy clay, some gravel	Clay, sand, and trace gravel	--	--	--	
96	7/7-9D3				275.0	289.0	83.8	88.1	no data	No data	--	--	--	
96	7/7-9D3				289.0	309.0	88.1	94.2	cemented gravel	Gravel	cemented	--	--	
96	7/7-9D3				309.0	319.0	94.2	97.2	no data	No data	--	--	--	
97	7/7-9D2	97	7/7-9D2	0	1	0.0	0.3	surface	Sand and clay	--	--	--	QTge	
97	7/7-9D2				1	15	0.3	4.6	sandy clay and gravel	Clay, sand, and gravel	--	--	--	
97	7/7-9D2				15	25	4.6	7.6	yellow sandy clay	Clay and sand (or sandstone)	--	--	--	
97	7/7-9D2				25	90	7.6	27.4	yellow clay and gravel	Clay and gravel	--	--	--	
97	7/7-9D2				90	130	27.4	39.6	yellow clay, soft	Clay	--	--	--	
97	7/7-9D2				130	160	39.6	48.8	yellow clay, sticky	Clay	--	--	--	
97	7/7-9D2				160	185	48.8	56.4	cement gravel	Gravel	cemented	--	--	
97	7/7-9D2				185	205	56.4	62.5	yellow clay and gravel, sticky	Clay and gravel	--	--	--	
97	7/7-9D2				205	210	62.5	64.0	hard gravel	Gravel	hard	--	--	
97	7/7-9D2				210	241	64.0	73.5	yellow clay and gravel	Clay and gravel	--	--	--	
97	7/7-9D2				241	245	73.5	74.7	loose gravel	Gravel	--	--	--	
97	7/7-9D2				245	250	74.7	76.2	yellow sticky clay	Clay	--	--	--	
97	7/7-9D2				250	255	76.2	77.7	soft yellow sandy clay	Clay and sand (or sandstone)	--	--	--	
97	7/7-9D2				255	263	77.7	80.2	gray clay and gravel	Clay and gravel	--	--	--	
97	7/7-9D2				263	267	80.2	81.4	yellow clay	Clay	--	--	--	
97	7/7-9D2				267	275	81.4	83.8	hard clay and gravel	Clay and gravel	hard	--	--	
97	7/7-9D2				275	280	83.8	85.3	loose gravel	Gravel	--	--	--	
97	7/7-9D2				280	300	85.3	91.4	hard gravel	Gravel	hard	--	--	
97	7/7-9D2				300	307	91.4	93.6	light blue mud	Sand and clay	--	--	--	
97	7/7-9D2				307	312	93.6	95.1	hard gravel and clay	Clay and gravel	hard	--	--	
97	7/7-9D2				312	320	95.1	97.5	soft gray clay	Clay	--	--	--	
97	7/7-9D2				320	323	97.5	98.5	hard yellow clay	Clay	hard	--	--	
98	7/7-8A2	98	7/7-8A2	0	210	0.0	64.0	no data	No data	--	--	--	--	
98	7/7-8A2				210	217	64.0	66.1	cemented gravel, gravel	Gravel	cemented	--	--	QTge
98	7/7-8A2				217	224	66.1	68.3	no data	No data	--	--	--	
98	7/7-8A2				224	228	68.3	69.5	clay and gravel	Clay and gravel	--	--	--	
98	7/7-8A2				228	230	69.5	70.1	no data	No data	--	--	--	
99	7/7-9D1	99	7/7-9D1	0	35	0.0	10.7	no data	No data	--	--	--	QTge	
99	7/7-9D1				35	45	10.7	13.7	fine packed gravel and sand	Sand (or sandstone) and gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
99	7/7-9D1			45	230	13.7	70.1	no data	No data	--	--	--	
99	7/7-9D1			230	245	70.1	74.7	coarse gravelly sand	Sand (or sandstone) and gravel	--	--	--	
99	7/7-9D1			230	245	70.1	74.7	no data	No data	--	--	--	
100	7/8-9D1	100	7/8-9D1	0	200	0.0	61.0	no data	No data	--	--	--	QTge
101	7/9-7G1	101	7/9-7G1	0	331	0.0	100.9	(cased to 40ft.)	No data	--	--	--	KJu
102	7/8-11G1	102	7/8-11G1	0	237	0.0	72.2	no data	No data	--	--	--	QTge
103	7/7-8G2	103	7/7-8G2	0	425	0.0	129.5	no data	No data	--	--	--	QTge
104	7/9-9F1	104	7/9-9F1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	
104	7/9-9F1			3	5	0.9	1.5	clay	Clay	--	--	--	
104	7/9-9F1			5	49	1.5	14.9	dry sand	Sand	--	--	--	
104	7/9-9F1			49	110	14.9	33.5	wet sand	Sand	--	--	--	
104	7/9-9F1			110	115	33.5	35.1	white clay	Clay	--	--	--	
104	7/9-9F1			115	180	35.1	54.9	sand, soft	Sand	--	--	--	
104	7/9-9F1			180	186	54.9	56.7	yellow clay	Clay	--	--	--	
104	7/9-9F1			186	220	56.7	67.1	blue sandstone	Sandstone	cemented	--	--	QTm
104	7/9-9F1			220	226	67.1	68.9	blue sand, soft (water)	Sand	--	--	--	
105	7/8-12H1	105	7/8-12H1	0	160	0.0	48.8	no data	No data	--	--	--	Tsv
105	7/8-12H1			160	184	48.8	56.1	perforated intervals	No data	--	--	--	
105	7/8-12H1			184	208	56.1	63.4	no data	No data	--	--	--	
105	7/8-12H1			208	255	63.4	77.7	perforated intervals	No data	--	--	--	
106	7/8-12E2	106	7/8-12E2	0	80	0.0	24.4	no data	No data	--	--	--	Tsv
106	7/8-12E2			80	298	24.4	90.8	perforated intervals	No data	--	--	--	
106	7/8-12E2			298	300	90.8	91.4	no data	No data	--	--	--	
107	7/9-10E1	107	7/9-10E1	160	100	48.8	30.5	sandstone, sand	Sand (or sandstone) and gravel	cemented	--	--	QTm
108	7/7-8M2	108	7/7-8M2	0	211	0.0	64.3	no data	No data	--	--	--	--
109	7/7-7F2	109	7/7-7F2	0	4	0.0	1.2	topsoil	Sand and clay	--	--	--	Tsv
109	7/7-7F2			4	36	1.2	11.0	black volcanic rock	Basalt	hard	--	--	
109	7/7-7F2			36	42	11.0	12.8	boulders	Gravel	--	--	--	
109	7/7-7F2			42	130	12.8	39.6	black volcanic rock	Basalt	hard	--	--	
109	7/7-7F2			130	155	39.6	47.2	boulders with red volcanic ash	Ash or tuff	--	--	--	
109	7/7-7F2			155	216	47.2	65.8	black volcanic rock	Basalt	hard	--	--	
109	7/7-7F2			216	221	65.8	67.4	red volcanic ash with boulders	Ash or tuff	--	--	--	
109	7/7-7F2			221	234	67.4	71.3	red volcanic ash	Ash or tuff	--	--	--	
109	7/7-7F2			234	283	71.3	86.3	black volcanic rock	Basalt	hard	--	--	
109	7/7-7F2			283	314	86.3	95.7	red volcanic ash	Ash or tuff	--	--	--	
109	7/7-7F2			314	320	95.7	97.5	black volcanic rock	Basalt	hard	--	--	
110	7/9-8J1	110	7/9-8J1	0	16	0.0	4.9	soil	Sand and clay	--	--	--	
110	7/9-8J1			16	55	4.9	16.8	yellow sand	Sand	--	--	--	
110	7/9-8J1			55	105	16.8	32.0	yellow-red sticky clay	Clay	--	--	--	
110	7/9-8J1			105	132	32.0	40.2	water, sand	Sand	--	--	--	
110	7/9-8J1			132	160	40.2	48.8	yellow sticky clay	Clay	--	--	--	
110	7/9-8J1			160	168	48.8	51.2	yellow and blue sandstone	Sandstone	cemented	--	--	QTm
110	7/9-8J1			168	205	51.2	62.5	blue sandstone	Sandstone	cemented	--	--	
110	7/9-8J1			205	240	62.5	73.2	water, sandstone	Sandstone	cemented	--	--	
110	7/9-8J1			240	245	73.2	74.7	sticky blue sandstone	Sandstone	cemented	--	--	
110	7/9-8J1			245	250	74.7	76.2	blue sandstone; washed gravel	Sand (or sandstone) and gravel	cemented	--	--	
111	7/8-11K1	111	7/8-11K1	0	238	0.0	72.5	no data	No data	--	--	--	QTge
111	7/8-11K1			238	254	72.5	77.4	sandstone	Sandstone	cemented	--	--	
112	7/8-10L1	112	7/8-10L1	0	100	0.0	30.5	no data	No data	--	--	--	QTge
112	7/8-10L1			100	114	30.5	34.7	"light gravel" and some coarse sand	Sand (or sandstone) and gravel	--	--	--	
112	7/8-10L1			114	212	34.7	64.6	no data	No data	--	--	--	
113	7/9-8K1	113	7/9-8K1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	
113	7/9-8K1			3	60	0.9	18.3	yellow clay	Clay	--	--	--	
113	7/9-8K1			60	140	18.3	42.7	yellow sand and clay	Sand and clay	--	--	--	
113	7/9-8K1			140	164	42.7	50.0	clay, blue hard	Clay	hard	--	--	
113	7/9-8K1			164	200	50.0	61.0	blue clay	Clay	--	--	--	
113	7/9-8K1			200	230	61.0	70.1	blue sand	Sand	--	--	--	
113	7/9-8K1			230	240	70.1	73.2	yellow sand	Sand	--	--	--	
113	7/9-8K1			240	260	73.2	79.2	sandstone	Sandstone	cemented	--	--	
113	7/9-8K1			260	276	79.2	84.1	sandstone and clay	Sandstone	cemented	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
113	7/9-8K1			276	350	84.1	106.7	sandstone	Sandstone	cemented	--	--	QTm
114	7/8-12K1	114	7/8-12K1	0	273	0.0	83.2	no data	No data	--	--	--	Tsv
				273	347	83.2	105.8	sand, clay, and gravel; sand and rock	Sand (or sandstone) and gravel	--	--	--	
115	7/8-12Q2	115	7/8-12Q2	125	95	38.1	29.0	sandy clay and gravel; clay and gravel	Clay, sand, and gravel	--	--	--	Tsv
116	7/7-8P2	116	7/7-8P2	233	250	71.0	76.2	volcanic ash	Ash or tuff	--	--	--	Tsv
117	7/7-8L1	117	7/7-8L1	0	25	0.0	7.6	yellow clay and boulders	Clay and gravel	--	--	--	QTge
117	7/7-8L1			25	75	7.6	22.9	yellow clay and gravel	Clay and gravel	--	--	--	
117	7/7-8L1			75	80	22.9	24.4	yellow clay and boulders	Clay and gravel	--	--	--	
117	7/7-8L1			80	172	24.4	52.4	yellow clay and gravel	Clay and gravel	--	--	--	
117	7/7-8L1			172	177	52.4	53.9	yellow clay and boulders	Clay and gravel	--	--	--	
117	7/7-8L1			177	178	53.9	54.3	yellow clay and gravel	Clay and gravel	--	--	--	
117	7/7-8L1			178	184	54.3	56.1	hard boulders	Gravel	hard	--	--	
117	7/7-8L1			184	208	56.1	63.4	rock	Ash or tuff	hard	--	--	Tsv
117	7/7-8L1			208	223	63.4	68.0	red volcanic ash	Ash or tuff	--	--	--	
117	7/7-8L1			223	278	68.0	84.7	hard volcanic rock	Ash or tuff	hard	--	--	
118	7/8-9R1	118	7/8-9R1	0	2	0.0	0.6	topsoil	Sand and clay	--	--	--	QTge
118	7/8-9R1			2	3	0.6	0.9	clay, yellow, and gravel	Clay and gravel	--	--	--	
118	7/8-9R1			3	6	0.9	1.8	hardpan	Clay and gravel	hard	--	--	
118	7/8-9R1			6	20	1.8	6.1	clay sandy brown	Clay and sand (or sandstone)	--	--	--	
118	7/8-9R1			20	28	6.1	8.5	clay, blue, and gravel	Clay and gravel	--	--	--	
118	7/8-9R1			28	32	8.5	9.8	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
118	7/8-9R1			32	35	9.8	10.7	clay, gray	Clay	--	--	--	
118	7/8-9R1			35	50	10.7	15.2	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
118	7/8-9R1			50	118	15.2	36.0	clay, yellow, and gravel	Clay and gravel	--	--	--	
118	7/8-9R1			118	136	36.0	41.5	small loose boulders	Gravel	--	--	--	
118	7/8-9R1			136	139	41.5	42.4	gravel	Gravel	--	--	--	
118	7/8-9R1			139	144	42.4	43.9	clay, creamy	Clay	--	--	--	
118	7/8-9R1			144	162	43.9	49.4	clay, brown	Clay	--	--	--	
118	7/8-9R1			162	165	49.4	50.3	gravel	Gravel	--	--	--	
118	7/8-9R1			165	180	50.3	54.9	clay, brown	Clay	--	--	--	
118	7/8-9R1			180	187	54.9	57.0	gravel	Gravel	--	--	--	
119	7/8-14A1	119	7/8-14A1	0	3	0.0	0.9	adobe	Sand and clay	--	--	--	Qyal and QTge
119	7/8-14A1			3	18	0.9	5.5	ash, black	Ash or tuff	--	--	--	
119	7/8-14A1			18	25	5.5	7.6	ash, yellow	Ash or tuff	--	--	--	
119	7/8-14A1			25	137	7.6	41.8	ash, brown	Ash or tuff	--	--	--	
119	7/8-14A1			137	153	41.8	46.6	clay, blue	Clay	--	--	--	
119	7/8-14A1			153	185	46.6	56.4	clay, yellow	Clay	--	--	--	
119	7/8-14A1			185	270	56.4	82.3	clay, blue	Clay	--	--	--	
119	7/8-14A1			270	350	82.3	106.7	clay, blue and gravel	Clay and gravel	--	--	--	
119	7/8-14A1			350	360	106.7	109.7	clay, blue	Clay	--	--	--	
119	7/8-14A1			360	470	109.7	143.3	rock	Ash or tuff	hard	--	--	Tsv
119	7/8-14A1			470	489	143.3	149.0	clay, blue	Clay	--	--	--	
119	7/8-14A1			489	548	149.0	167.0	clay, blue, and rock	Clay and gravel	--	--	--	
119	7/8-14A1			548	621	167.0	189.3	rock	Ash or tuff	hard	--	--	
119	7/8-14A1			621	640	189.3	195.1	clay	Clay	--	--	--	
119	7/8-14A1			640	671	195.1	204.5	rock	Ash or tuff	hard	--	--	
119	7/8-14A1			671	899	204.5	274.0	clay	Clay	--	--	--	
119	7/8-14A1			899	901	274.0	274.6	rock	Ash or tuff	hard	--	--	
120	7/7-16A1	120	7/7-16A1	0	200	0.0	61.0	no record	No data	--	--	--	QTge
120	7/7-16A1			200	207	61.0	63.1	loose gravel boulders	Gravel	--	--	--	
120	7/7-16A1			207	230	63.1	70.1	yellow clay and gravel	Clay and gravel	--	--	--	
120	7/7-16A1			230	235	70.1	71.6	hard gravel and clay	Clay and gravel	--	--	--	
120	7/7-16A1			235	243	71.6	74.1	soft gravel and yellow clay	Clay and gravel	--	--	--	
120	7/7-16A1			243	249	74.1	75.9	hard yellow clay and gravel	Clay and gravel	hard	--	--	
120	7/7-16A1			249	253	75.9	77.1	soft, sandy yellow clay	Clay and sand (or sandstone)	--	--	--	
120	7/7-16A1			253	255	77.1	77.7	hard yellow clay	Clay	hard	--	--	
120	7/7-16A1			255	262	77.7	79.9	soft, sandy yellow clay	Clay and sand (or sandstone)	--	--	--	
120	7/7-16A1			262	263	79.9	80.2	hard yellow clay	Clay	hard	--	--	
121	7/7-15C1	121	7/7-15C1	0	1	0.0	0.3	soil	Sand and clay	--	--	--	Qyal

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
121	7/7-15C1			1	20	0.3	6.1	boulders	Gravel	--	--	--	
121	7/7-15C1			20	26	6.1	7.9	clay yellow	Clay	--	--	--	QTge
121	7/7-15C1			26	48	7.9	14.6	yellow clay, hard, sandy	Clay and sand (or sandstone)	hard	--	--	
121	7/7-15C1			48	54	14.6	16.5	boulders	Gravel	--	--	--	
121	7/7-15C1			54	108	16.5	32.9	clay, yellow; water at 55 feet et	Clay	--	--	--	
121	7/7-15C1			108	119	32.9	36.3	yellow clay and gravel	Clay and gravel	--	--	--	
121	7/7-15C1			119	139	36.3	42.4	yellow clay and gravel	Clay and gravel	--	--	--	
121	7/7-15C1			139	160	42.4	48.8	boulders	Gravel	--	--	--	
121	7/7-15C1			160	179	48.8	54.6	yellow clay and boulders	Clay and gravel	--	--	--	
121	7/7-15C1			179	189	54.6	57.6	boulders, yellow clay, and gravel	Clay and gravel	--	--	--	
121	7/7-15C1			189	211	57.6	64.3	clay and boulders	Clay and gravel	--	--	--	
121	7/7-15C1			211	258	64.3	78.6	boulders and rock	Gravel	hard	--	--	
121	7/7-15C1			258	277	78.6	84.4	yellow clay and boulders	Clay and gravel	--	--	--	
121	7/7-15C1			277	289	84.4	88.1	yellow clay and gravel	Clay and gravel	--	--	--	
121	7/7-15C1			289	293	88.1	89.3	boulders	Gravel	--	--	--	
121	7/7-15C1			293	309	89.3	94.2	yellow clay and boulders	Clay and gravel	--	--	--	
121	7/7-15C1			309	312	94.2	95.1	red clay and gravel	Clay and gravel	--	--	--	
121	7/7-15C1			312	322	95.1	98.1	red clay	Clay	--	--	--	
								white sandy clay and gravel; well flowed 20 gallons per hour at 342 feet					
121	7/7-15C1			322	342	98.1	104.2	Clay, sand, and gravel	--	--	--	--	
121	7/7-15C1			342	345	104.2	105.2	white sandy clay	Clay and sand (or sandstone)	--	--	--	
121	7/7-15C1			345	363	105.2	110.6	gravel and sand	Sand (or sandstone) and gravel	--	--	--	
121	7/7-15C1			363	397	110.6	121.0	sandy clay and gravel	Clay, sand, and gravel	--	--	--	
122	7/7-17A1	122	7/7-17A1	0	3	0.0	0.9	topsoil	Sand and clay	--	--	--	Qyal and Qoal (?)
122	7/7-17A1			3	44	0.9	13.4	boulders	Clay and gravel	--	--	--	
122	7/7-17A1			44	48	13.4	14.6	gravel	Gravel	--	--	--	
122	7/7-17A1			48	76	14.6	23.2	clay, yellow, and gravel	Clay and gravel	--	--	--	
122	7/7-17A1			76	85	23.2	25.9	boulders and gravel	Gravel	--	--	--	
122	7/7-17A1			85	90	25.9	27.4	rock	Ash or tuff	hard	--	--	Tsv
122	7/7-17A1			90	96	27.4	29.3	rock, basalt	Basalt	--	--	--	
122	7/7-17A1			96	110	29.3	33.5	ash, red, volcanic	Ash or tuff	--	--	--	
122	7/7-17A1			110	145	33.5	44.2	ash, red, volcanic, and gravel	Ash or tuff	--	--	--	
122	7/7-17A1			145	165	44.2	50.3	clay, yellow, and rock	Clay and gravel	--	--	--	
122	7/7-17A1			165	205	50.3	62.5	ash, red, volcanic, and boulders	Ash or tuff	--	--	--	
122	7/7-17A1			205	213	62.5	64.9	rock, black	Basalt	hard	--	--	
122	7/7-17A1			213	258	64.9	78.6	ash, red, volcanic, and boulders	Ash or tuff	--	--	--	
122	7/7-17A1			258	263	78.6	80.2	rock, black	Basalt	hard	--	--	
122	7/7-17A1			263	268	80.2	81.7	ash, red, volcanic, and boulders	Ash or tuff	--	--	--	
122	7/7-17A1			268	270	81.7	82.3	rock, black	Basalt	hard	--	--	
122	7/7-17A1			270	276	82.3	84.1	rock, blue	Sandstone	hard	--	--	
122	7/7-17A1			276	280	84.1	85.3	ash, red, volcanic, and boulders	Ash or tuff	--	--	--	
122	7/7-17A1			280	307	85.3	93.6	rock, red, volcanic	Ash or tuff	hard	--	--	
122	7/7-17A1			307	364	93.6	110.9	rock	Ash or tuff	hard	--	--	
122	7/7-17A1			364	392	110.9	119.5	clay, yellow, and gravel	Clay and gravel	--	--	--	
122	7/7-17A1			392	419	119.5	127.7	gravel, blue cement, and boulders	Gravel	cemented	--	--	
122	7/7-17A1			419	425	127.7	129.5	sandstone, blue	Sandstone	cemented	--	--	QTm
122	7/7-17A1			425	495	129.5	150.9	sandstone, blue, and boulders	Sand (or sandstone) and gravel	cemented	--	--	
122	7/7-17A1			495	505	150.9	153.9	sandstone, blue	Sandstone	cemented	--	--	
122	7/7-17A1			505	522	153.9	159.1	clay, blue, and gravel	Clay and gravel	--	--	--	
122	7/7-17A1			522	523	159.1	159.4	rock, black	Basalt	hard	--	--	Tsv and QTm
122	7/7-17A1			523	531	159.4	161.8	rock	Ash or tuff	hard	--	--	
122	7/7-17A1			531	538	161.8	164.0	clay, blue, and gravel	Clay and gravel	--	--	--	
122	7/7-17A1			538	560	164.0	170.7	rock, blue	Sandstone	hard	--	--	
122	7/7-17A1			560	565	170.7	172.2	rock, red, volcanic	Ash or tuff	hard	--	--	
122	7/7-17A1			565	640	172.2	195.1	rock, blue	Sandstone	hard	--	--	
122	7/7-17A1			640	656	195.1	199.9	rock, red, volcanic	Ash or tuff	hard	--	--	
122	7/7-17A1			656	669	199.9	203.9	rock, black	Basalt	hard	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
122	7/7-17A1			669	675	203.9	205.7	rock, blue, and clamshells (much of blue rock reported is probably sandstone)	Sandstone	cemented	shells	shells	
122	7/7-17A1			675	747	205.7	227.7	rock, blue	Sandstone	hard	--	--	
122	7/7-17A1			747	765	227.7	233.2	rock, blue, little red	Sandstone	hard	--	--	
122	7/7-17A1			765	768	233.2	234.1	rock, blue	Sandstone	hard	--	--	
122	7/7-17A1			768	783	234.1	238.7	rock, blue, volcanic	Ash or tuff	hard	--	--	
122	7/7-17A1			783	807	238.7	246.0	rock, red, hard	Ash or tuff	hard	--	--	
122	7/7-17A1			807	841	246.0	256.3	rock, blue	Sandstone	hard	--	--	
122	7/7-17A1			841	846	256.3	257.9	blue and red	Sandstone	--	--	--	
123	7/9-15E2	123	7/9-15E2	0	215	0.0	65.5	no data	No data	--	--	--	
123	7/9-15E2			215	220	65.5	67.1	sand and shells	Sand	--	shells	--	QTm
124	7/8-14D1	124	7/8-14D1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Qyal and QTge
124	7/8-14D1			4	17	1.2	5.2	clay	Clay	--	--	--	
124	7/8-14D1			17	20	5.2	6.1	gravel	Gravel	--	--	--	
124	7/8-14D1			20	85	6.1	25.9	clay, yellow	Clay	--	--	--	
124	7/8-14D1			85	95	25.9	29.0	gravel, cemented	Gravel	cemented	--	--	
124	7/8-14D1			95	146	29.0	44.5	clay, yellow	Clay	--	--	--	
124	7/8-14D1			146	162	44.5	49.4	gravel	Gravel	--	--	--	
124	7/8-14D1			162	188	49.4	57.3	clay and gravel	Clay and gravel	--	--	--	
124	7/8-14D1			188	200	57.3	61.0	gravel, free	Gravel	--	--	--	
124	7/8-14D1			200	250	61.0	76.2	clay and gravel mix	Clay and gravel	--	--	--	
124	7/8-14D1			250	265	76.2	80.8	clay, sandy	Clay and sand (or sandstone)	--	--	--	
124	7/8-14D1			265	285	80.8	86.9	gravel, cemented, hard	Gravel	cemented	--	--	
124	7/8-14D1			285	300	86.9	91.4	clay and gravel, hard	Clay and gravel	hard	--	--	
125	7/8-14E1	125	7/8-14E1	0	761	0.0	232.0	no data	No data	--	--	--	QTge
126	7/9-18J1	126	7/9-18J1	0	650	0.0	198.1	no data	No data	--	--	--	KJu
127	7/8-18M1	127	7/8-18M1	0	640	0.0	195.1	no data	No data	--	--	--	QTge
128	7/9-13M1	128	7/9-13M1	0	2	0.0	0.6	topsoil	Sand and clay	--	--	--	
128	7/9-13M1			2	10	0.6	3.0	yellow clay and gravel	Clay and gravel	--	--	--	
128	7/9-13M1			10	25	3.0	7.6	yellow clay	Clay	--	--	--	
128	7/9-13M1			25	40	7.6	12.2	blue clay	Clay	--	--	--	
128	7/9-13M1			40	52	12.2	15.8	sandy blue clay	Clay and sand (or sandstone)	--	--	--	
128	7/9-13M1			52	55	15.8	16.8	blue sand	Sand	--	--	--	
128	7/9-13M1			55	80	16.8	24.4	blue clay and gravel	Clay and gravel	--	--	--	
128	7/9-13M1			80	235	24.4	71.6	blue clay	Clay	--	--	--	
128	7/9-13M1			235	316	71.6	96.3	sandy blue clay	Clay and sand (or sandstone)	--	--	--	QTm
129	7/8-14M1	129	7/8-14M1	0	227.8	0.0	69.4	no data	No data	--	--	--	QTge
130	7/8-13J1B	130	7/8-13J1B	0	148	0.0	45.1	no data	No data	--	--	--	QTge(?)
130	7/8-13J1B			148	253	45.1	77.1	perforated intervals	No data	--	--	--	
131	7/8-18K1	131	7/8-18K1	0	20	0.0	6.1	sand and gravel	Sand (or sandstone) and gravel	--	--	--	QTge(?)
131	7/8-18K1			20	34	6.1	10.4	no data	No data	--	--	--	
131	7/8-18K1			34	40	10.4	12.2	no data	No data	--	--	--	
131	7/8-18K1			40	42	12.2	12.8	gravel	Gravel	--	--	--	
131	7/8-18K1			42	330	12.8	100.6	no data	No data	--	--	--	
131	7/8-18K1			330	416	100.6	126.8	gravel	Gravel	--	--	--	
131	7/8-18K1			416	420	126.8	128.0	no data	No data	--	--	--	
132	7/9-18K1	132	7/9-18K1	0	266	0.0	81.1	(reported "dry hole")	No data	--	--	--	KJu (?)
133	7/9-16L1	133	7/9-16L1	0	255	0.0	77.7	no data	No data	--	--	--	QTm
134	7/8-13J2	134	7/8-13J2	0	188	0.0	57.3	no data	No data	--	--	--	Tsv (?)
134	7/8-13J2			188	206	57.3	62.8	perforated intervals	No data	--	--	--	
134	7/8-13J2			206	210	62.8	64.0	no data	No data	--	--	--	
135	7/8-18Q1	135	7/8-18Q1	0	50	0.0	15.2	no data	No data	--	--	--	--
135	7/8-18Q1			50	55	15.2	16.8	sandy clay and gravel	Clay, sand, and gravel	--	--	--	QTge
135	7/8-18Q1			55	130	16.8	39.6	no data	No data	--	--	--	
135	7/8-18Q1			130	153	39.6	46.6	cemented gravel, sand and clay	Gravel	cemented	--	--	
135	7/8-18Q1			153	192	46.6	58.5	no data	No data	--	--	--	
135	7/8-18Q1			192	198	58.5	60.4	coarse cemented gravel	Gravel	cemented	--	--	
135	7/8-18Q1			198	222	60.4	67.7	no data	No data	--	--	--	
135	7/8-18Q1			222	236	67.7	71.9	clay and gravel	Clay and gravel	--	--	--	
135	7/8-18Q1			236	881	71.9	268.5	no data	No data	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
136	7/8-13K1	136	7/8-13K1	0	129	0.0	39.3	no data	No data	--	--	--	QTge
136	7/8-13K1			129	135	39.3	41.1	cemented gravel	Clay and gravel	cemented	--	--	
136	7/8-13K1			135	272	41.1	82.9	no data	No data	--	--	--	
136	7/8-13K1							clay and gravel; cemented gravel;					
136	7/8-13K1			272	431	82.9	131.4	coarse gravel; clay	Clay and gravel	cemented	--	--	
136	7/8-13K1			431	529	131.4	161.2	no data	No data	--	--	--	
137	7/9-15Q1	137	7/9-15Q1	0	200	0.0	61.0	no data	No data	--	--	--	QTm
138	7/9-14K1	138	7/9-14K1	0	2	0.0	0.6	topsoil	Sand and clay	--	--	--	QTge
138	7/9-14K1			2	16	0.6	4.9	clay and sand	Clay and sand (or sandstone)	--	--	--	
138	7/9-14K1			16	20	4.9	6.1	sand	Sand	--	--	--	
138	7/9-14K1			20	23	6.1	7.0	clay, hard	Clay	hard	--	--	
138	7/9-14K1			23	35	7.0	10.7	sand	Sand	--	--	--	
138	7/9-14K1			35	40	10.7	12.2	gravel, very small; water	Gravel	--	--	--	
138	7/9-14K1			40	62	12.2	18.9	clay, sticky blue	Clay	--	--	--	
138	7/9-14K1			62	86	18.9	26.2	clay and gravel mix	Clay and gravel	--	--	--	
138	7/9-14K1			86	106	26.2	32.3	clay and gravel mix	Clay and gravel	--	--	--	
138	7/9-14K1			106	138	32.3	42.1	clay and sand mix	Clay and sand (or sandstone)	--	--	--	
138	7/9-14K1			138	208	42.1	63.4	sand, blue	Sand	--	--	--	QTm
138	7/9-14K1			208	257	63.4	78.3	sand, blue and some gravel	Sand (or sandstone) and gravel	--	--	--	
138	7/9-14K1			257	296	78.3	90.2	sand and gravel, small	Sand (or sandstone) and gravel	--	--	--	
138	7/9-14K1			296	358	90.2	109.1	gravel, small	Gravel	--	--	--	
138	7/9-14K1			358	560	109.1	170.7	shells and gravel mix	Sand (or sandstone) and gravel	--	shells	--	
138	7/9-14K1			560	570	170.7	173.7	gravel, fine	Gravel	--	--	--	
138	7/9-14K1			570	584	173.7	178.0	sand and shells	Sand	--	shells	--	
138	7/9-14K1			584	636	178.0	193.9	shale	Clay and sand (or sandstone)	cemented	--	--	
139	7/7-18L1	139	7/7-18L1	0	36	0.0	11.0	clay, yellow, and gravel	Clay and gravel	--	--	--	Qyal and Qoal (?) and QTge
139	7/7-18L1			36	78	11.0	23.8	gravel	Gravel	--	--	--	
139	7/7-18L1			78	157	23.8	47.9	clay, blue, and gravel	Clay and gravel	--	--	--	
139	7/7-18L1			157	161	47.9	49.1	rock	Ash or tuff	hard	--	--	Tsv
140	7/9-16Q1A	140	7/9-16Q1A	0	268	0.0	81.7	no data	No data	--	--	--	QTm
141	7/9-16Q1B	141	7/9-16Q1B	0	321	0.0	97.8	no data	No data	--	--	--	--
142	7/9-13R1	142	7/9-13R1	0	37	0.0	11.3	no data	No data	--	--	--	
142	7/9-13R1			37	46	11.3	14.0	sand and gravel; clay and gravel	Clay, sand, and gravel	--	--	--	QTge
142	7/9-13R1			46	70	14.0	21.3	no data	No data	--	--	--	
142	7/9-13R1			70	81	21.3	24.7	clay and gravel; gravel	Clay and gravel	--	--	--	
142	7/9-13R1			81	94	24.7	28.7	no data	No data	--	--	--	
142	7/9-13R1			94	120	28.7	36.6	clay and gravel	Clay and gravel	--	--	--	
142	7/9-13R1			120	130	36.6	39.6	no data	No data	--	--	--	
142	7/9-13R1			130	170	39.6	51.8	clay and gravel	Clay and gravel	--	--	--	
142	7/9-13R1			170	264	51.8	80.5	no data	No data	--	--	--	
142	7/9-13R1			264	275	80.5	83.8	clay and gravel	Clay and gravel	--	--	--	
142	7/9-13R1			275	330	83.8	100.6	no data	No data	--	--	--	
142	7/9-13R1			330	375	100.6	114.3	sandy clay and gravel; gravel	Clay, sand, and gravel	--	--	--	
143	7/8-17N1	143	7/8-17N1	0	3	0.0	165.8	no data	No data	--	--	--	Qyal
143	7/8-17N1			3	36.0	0.9	11.0	soft sandstone, gravel	Sand (or sandstone) and gravel	cemented	--	--	Qyal
143	7/8-17N1			36.0	52.0	11.0	15.8	no data	No data	--	--	--	
143	7/8-17N1			52.0	62.0	15.8	18.9	gravel	Gravel	--	--	--	QTge
143	7/8-17N1			62.0	162.0	18.9	49.4	no data	No data	--	--	--	
143	7/8-17N1			162.0	164.0	49.4	50.0	cemented gravel	Gravel	cemented	--	--	
143	7/8-17N1			164.0	234.0	50.0	71.3	no data	No data	--	--	--	
143	7/8-17N1							sandy clay, soft streaks with					
143	7/8-17N1			234.0	268.0	71.3	81.7	gravel; cemented gravel.	Clay, sand, and trace gravel	cemented	--	--	
143	7/8-17N1			268.0	376.0	81.7	114.6	no data	No data	--	--	--	
143	7/8-17N1			376.0	384.0	114.6	117.0	cemented gravel	Gravel	cemented	--	--	
143	7/8-17N1			384.0	424.0	117.0	129.2	no data	No data	--	--	--	
143	7/8-17N1			424.0	430.0	129.2	131.1	cemented gravel	Gravel	cemented	--	--	
143	7/8-17N1			430.0	506.0	131.1	154.2	no data	No data	--	--	--	
143	7/8-17N1			506.0	516.0	154.2	157.3	sandstone	Sandstone	cemented	--	--	
143	7/8-17N1			516.0	544.0	157.3	165.8	no data	No data	--	--	--	
144	7/9-21B1	144	7/9-21B1	0	550	0.0	167.6	no data	No data	--	--	--	QTm
145	7/7-18R2	145	7/7-18R2	0	4	0.0	1.2	adobe	Sand and clay	--	--	--	Qyal and Qoal (?) and QTge

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
145	7/7-18R2			4	20	1.2	6.1	clay, blue	Clay	--	--	--	
145	7/7-18R2			20	30	6.1	9.1	clay, sandy, blue, some gravel	Clay, sand, and trace gravel	--	--	--	
145	7/7-18R2			30	35	9.1	10.7	clay, sandy, blue, and gravel	Clay, sand, and gravel	--	--	--	
145	7/7-18R2			35	40	10.7	12.2	gravel and wood	Gravel	--	--	wood	
145	7/7-18R2			40	41	12.2	12.5	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
145	7/7-18R2			41	50	12.5	15.2	clay, blue	Clay	--	--	--	
145	7/7-18R2			50	65	15.2	19.8	gravel, blue, cemented	Gravel	cemented	--	--	
145	7/7-18R2			65	88	19.8	26.8	volcanic rock, soft	Ash or tuff	--	--	--	Tsv
145	7/7-18R2			88	90	26.8	27.4	volcanic rock, hard	Ash or tuff	hard	--	--	
145	7/7-18R2			90	123	27.4	37.5	volcanic rock, streaks of soft	Ash or tuff	--	--	--	
145	7/7-18R2			123	206	37.5	62.8	volcanic rock	Ash or tuff	--	--	--	
146	7/8-24A2	146	7/8-24A2	0	930	0.0	283.5	no data	No data	--	--	--	Qyal and QTge and Tsv (?)
147	7/7-18N1	147	7/7-18N1	0	11	0.0	3.4	soil	Sand and clay	--	--	--	Qyal and Qoal (?) and QTge
147	7/7-18N1			11	28	3.4	8.5	clay, yellow	Clay	--	--	--	
147	7/7-18N1			28	30	8.5	9.1	rock	Gravel	hard	--	--	
147	7/7-18N1			30	50	9.1	15.2	gravel, free	Gravel	--	--	--	
147	7/7-18N1			50	65	15.2	19.8	gravel	Gravel	--	--	--	
147	7/7-18N1			65	69	19.8	21.0	sand, gray	Sand	--	--	--	
147	7/7-18N1			69	75	21.0	22.9	clay, blue	Clay	--	--	--	
147	7/7-18N1			75	78	22.9	23.8	clay, blue	Clay	--	--	--	
147	7/7-18N1			78	80	23.8	24.4	gravel	Gravel	--	--	--	
147	7/7-18N1			80	87	24.4	26.5	clay and rock	Clay and gravel	--	--	--	
147	7/7-18N1			87	108	26.5	32.9	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
147	7/7-18N1			108	111	32.9	33.8	gravel	Gravel	--	--	--	
147	7/7-18N1			111	115	33.8	35.1	clay, sandy	Clay and sand (or sandstone)	--	--	--	
147	7/7-18N1			115	133	35.1	40.5	gravel	Gravel	--	--	--	
147	7/7-18N1			133	140	40.5	42.7	clay and rock	Clay and gravel	--	--	--	
148	7/8-21C1	148	7/8-21C1	0	310	0.0	94.5	no data	No data	--	--	--	QTge
149	7/8-20C1	149	7/8-20C1	0	77	0.0	23.5	no data	No data	--	--	--	--
149	7/8-20C1			77	80	23.5	24.4	gravel	Gravel	--	--	--	QTge
149	7/8-20C1			80	230	24.4	70.1	no data	No data	--	--	--	
149	7/8-20C1			230	231	70.1	70.4	gravel	Gravel	--	--	--	
149	7/8-20C1			231	539	70.4	164.3	no data	No data	--	--	--	
149	7/8-20C1			539	542	164.3	165.2	gravel	Gravel	--	--	--	
149	7/8-20C1			542	580	165.2	176.8	no data	No data	--	--	--	
149	7/8-20C1			580	582	176.8	177.4	gravel	Gravel	--	--	--	
149	7/8-20C1			582	591	177.4	180.1	no data	No data	--	--	--	
149	7/8-20C1							sand containing trace of soft clay,					
149	7/8-20C1			591	623	180.1	189.9	gravel	Sand and clay	--	--	--	
149	7/8-20C1			623	625	189.9	190.5	no data	No data	--	--	--	
150	7/9-21C1	150	7/9-21C1	0	290	0.0	88.4	no data	No data	--	--	--	--
150	7/9-21C1			290	325	88.4	99.1	sandstone	Sandstone	cemented	--	--	QTm
151	7/8-24A3	151	7/8-24A3	0	300	0.0	91.4	no data	No data	--	--	--	Qyal and QTge
152	7/9-23F1	152	7/9-23F1	0	6	0.0	1.8	black adobe soil	Sand and clay	--	--	--	
152	7/9-23F1			6	12	1.8	3.7	brown clay	Clay	--	--	--	
152	7/9-23F1			12	15	3.7	4.6	brown gravelly clay	Clay and gravel	--	--	--	
152	7/9-23F1			15	35	4.6	10.7	blue sandstone	Sandstone	cemented	--	--	QTm
152	7/9-23F1			35	37	10.7	11.3	blue sand, water	Sand	--	--	--	
152	7/9-23F1			37	48	11.3	14.6	blue sandy clay	Clay and sand (or sandstone)	--	--	--	
152	7/9-23F1			48	50	14.6	15.2	blue sand and quicksand	Sand and clay	--	--	--	
152	7/9-23F1			50	58	15.2	17.7	blue coarse sandstone	Sandstone	cemented	--	--	
152	7/9-23F1			58	65	17.7	19.8	gray quicksand	Sand and clay	--	--	--	
152	7/9-23F1			65	70	19.8	21.3	blue sandy sedimentary clay	Clay and sand (or sandstone)	--	--	--	
152	7/9-23F1			70	98	21.3	29.9	blue coarse sandstone	Sandstone	cemented	--	--	
152	7/9-23F1			98	114	29.9	34.7	blue fine sandstone	Sandstone	cemented	--	--	
152	7/9-23F1			114	120	34.7	36.6	blue sand and quicksand	Sand and clay	--	--	--	
152	7/9-23F1							blue coarse sand and gravel with quicksand	Clay, sand, and gravel	--	--	--	
152	7/9-23F1			120	170	36.6	51.8	blue coarse sand and oyster					
152	7/9-23F1			170	212	51.8	64.6	shells	Sand	--	shells	--	
152	7/9-23F1			212	225	64.6	68.6	fine gravel and quicksand	Sand (or sandstone) and gravel	--	--	--	

**Appendix 3. Lithologic data. —Continued**

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
152	7/9-23F1			225	310	68.6	94.5	oyster shell and gravelly sandstone	Sand (or sandstone) and gravel	cemented	shells	--	
152	7/9-23F1			310	320	94.5	97.5	medium gray sand, water	Sand	--	--	--	
152	7/9-23F1			320	420	97.5	128.0	coarse gray sandstone and shells	Sandstone	cemented	shells	--	
152	7/9-23F1			420	425	128.0	129.5	dark gray sand, water	Sand	--	--	--	
152	7/9-23F1			425	590	129.5	179.8	gray sandstone and shells	Sandstone	cemented	shells	--	
152	7/9-23F1			590	610	179.8	185.9	medium beach gray sand, water	Sand	--	--	--	
153	7/8-20D1	153	7/8-20D1	0	190	0.0	57.9	no data	No data	--	--	--	QTge
153	7/8-20D1			190	294	57.9	89.6	clay and gravel	Clay and gravel	--	--	--	
153	7/8-20D1			294	446	89.6	135.9	no data	No data	--	--	--	
153	7/8-20D1			446	476	135.9	145.1	cemented gravel.	Gravel	cemented	--	--	
153	7/8-20D1			476	484	145.1	147.5	no data	No data	--	--	--	
154	7/8-24A5	154	7/8-24A5	0	50	0.0	15.2	no data	No data	--	--	--	QTge
154	7/8-24A5			50	170	15.2	51.8	perforated intervals	No data	--	--	--	
154	7/8-24A5			170	186	51.8	56.7	no data	No data	--	--	--	
154	7/8-24A5			186	288	56.7	87.8	perforated intervals	No data	--	--	--	
154	7/8-24A5			288	291	87.8	88.7	no data	No data	--	--	--	
155	7/8-24A6	155	7/8-24A6	0	1200.0	0.0	365.8	no data	No data	--	--	--	Qyal (?) and QTge and Tsv (?) Tsv
156	7/7-14A1			0	120	0.0	36.6	rock, soft, brown	Ash or tuff	hard	--	--	
156	7/7-14A1			120	208	36.6	63.4	soft red rock	Ash or tuff	--	--	--	
156	7/7-14A1			208	222	63.4	67.7	dark brown rock	Ash or tuff	--	--	--	
156	7/7-14A1			222	281	67.7	85.6	hard red rock with many seams	Ash or tuff	hard	--	--	
156	7/7-14A1			281	434	85.6	132.3	hard brown rock with many seams	Ash or tuff	hard	--	--	
156	7/7-14A1			434	488	132.3	148.7	soft yellow-brown rock with many seams	Ash or tuff	--	--	--	
156	7/7-14A1			488	580	148.7	176.8	hard red rock, very seamy	Ash or tuff	hard	--	--	
156	7/7-14A1			580	620	176.8	189.0	harder red rock, very seamy	Ash or tuff	hard	--	--	
156	7/7-14A1			620	622	189.0	189.6	very hard red rock, very seamy	Ash or tuff	hard	--	--	
157	7/7-23A1	157	7/7-23A1	0	3	0.0	0.9	topsoil	Sand and clay	--	--	--	QTge
157	7/7-23A1			3	18	0.9	5.5	boulders	Gravel	--	--	--	
157	7/7-23A1			18	30	5.5	9.1	clay and boulders	Clay and gravel	--	--	--	
157	7/7-23A1			30	63	9.1	19.2	clay and rock	Clay and gravel	--	--	--	
157	7/7-23A1			63	73	19.2	22.3	rock	Ash or tuff	hard	--	--	
157	7/7-23A1			73	94	22.3	28.7	clay and gravel	Clay and gravel	--	--	--	
157	7/7-23A1			94	168	28.7	51.2	gravel cemented	Gravel	cemented	--	--	
157	7/7-23A1			168	190	51.2	57.9	cemented gravel and boulders	Gravel	cemented	--	--	
157	7/7-23A1			190	207	57.9	63.1	blue clay and boulders	Clay and gravel	--	--	--	
157	7/7-23A1			207	250	63.1	76.2	red clay and boulders	Clay and gravel	--	--	--	
157	7/7-23A1			250	258	76.2	78.6	sandy blue clay and gravel	Clay, sand, and gravel	--	--	--	
157	7/7-23A1			258	270	78.6	82.3	gravel	Gravel	--	--	--	
157	7/7-23A1			270	273	82.3	83.2	gravel	Gravel	--	--	--	
157	7/7-23A1			273	300	83.2	91.4	blue clay and gravel	Clay and gravel	--	--	--	
157	7/7-23A1			300	303	91.4	92.4	clay and rock	Clay and gravel	--	--	--	
157	7/7-23A1			303	320	92.4	97.5	cemented gravel	Gravel	cemented	--	--	
157	7/7-23A1			320	337	97.5	102.7	blue sand and gravel	Sand (or sandstone) and gravel	--	--	--	
157	7/7-23A1			337	340	102.7	103.6	blue clay and gravel	Clay and gravel	--	--	--	
157	7/7-23A1			340	365	103.6	111.3	sandy yellow clay and gravel	Clay, sand, and gravel	--	--	--	
158	7/8-24A4	158	7/8-24A4	0	5	0.0	1.5	topsoil	Sand and clay	--	--	--	Qyal and Qoal (?) and QTge
158	7/8-24A4			5	17	1.5	5.2	hardpan	Clay and gravel	hard	--	--	
158	7/8-24A4			17	22	5.2	6.7	clay, blue	Clay	--	--	--	
158	7/8-24A4			22	26	6.7	7.9	sand and gravel, first water	Sand (or sandstone) and gravel	--	--	--	
158	7/8-24A4			26	30	7.9	9.1	blue clay	Clay	--	--	--	
158	7/8-24A4			30	50	9.1	15.2	gravel and boulders	Gravel	--	--	--	
158	7/8-24A4			50	56	15.2	17.1	clay and gravel	Clay and gravel	--	--	--	
158	7/8-24A4			56	74	17.1	22.6	gravel and boulders	Gravel	--	--	--	
158	7/8-24A4			74	90	22.6	27.4	gravel, cemented	Gravel	cemented	--	--	
158	7/8-24A4			90	101	27.4	30.8	solidified sand and gravel	Sand (or sandstone) and gravel	--	--	--	
158	7/8-24A4			101	126	30.8	38.4	blue clay	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
158	7/8-24A4			126	132	38.4	40.2	coarse gravel	Gravel	--	--	--	
158	7/8-24A4			132	142	40.2	43.3	clay and gravel, boulders	Clay and gravel	--	--	--	
158	7/8-24A4			142	146	43.3	44.5	loose gravel	Gravel	--	--	--	
158	7/8-24A4			146	163	44.5	49.7	sand and gravel	Sand (or sandstone) and gravel	--	--	--	QTge (?) and QTm
158	7/8-24A4			163	181	49.7	55.2	volcanic gravel	Gravel	--	--	--	
158	7/8-24A4			181	196	55.2	59.7	solidified sand	Sand	--	--	--	
158	7/8-24A4			196	207	59.7	63.1	basalt and boulders	Basalt	--	--	--	
158	7/8-24A4			207	227	63.1	69.2	sand and gravel solidified	Sand (or sandstone) and gravel	--	--	--	
158	7/8-24A4			227	239	69.2	72.8	gravel and boulders	Gravel	--	--	--	
158	7/8-24A4			239	252	72.8	76.8	sand solidified	Sandstone	--	--	--	
158	7/8-24A4			252	255	76.8	77.7	gravel and boulders	Gravel	--	--	--	
158	7/8-24A4			255	261	77.7	79.6	sand and gravel solidified	Sand (or sandstone) and gravel	--	--	--	
158	7/8-24A4			261	327	79.6	99.7	cemented gravel	Gravel	cemented	--	--	
158	7/8-24A4			327	334	99.7	101.8	brown clay	Clay	--	--	--	
158	7/8-24A4			334	363	101.8	110.6	gravel	Gravel	--	--	--	
158	7/8-24A4			363	391	110.6	119.2	blue clay, sticky	Clay	--	--	--	
158	7/8-24A4			391	428	119.2	130.5	gravel and boulders, cemented	Gravel	cemented	--	--	
158	7/8-24A4			428	441	130.5	134.4	black shale	Clay and sand (or sandstone)	cemented	--	--	
158	7/8-24A4			441	462	134.4	140.8	gravel, cemented	Gravel	cemented	--	--	
158	7/8-24A4			462	530	140.8	161.5	clay and boulders	Clay and gravel	--	--	--	
158	7/8-24A4			530	554	161.5	168.9	boulders, cemented	Gravel	cemented	--	--	
158	7/8-24A4			554	606	168.9	184.7	blue clay, very tough and sticky	Clay	--	--	--	
158	7/8-24A4			606	642	184.7	195.7	volcanic ash	Ash or tuff	--	--	--	Tsv
158	7/8-24A4			642	692	195.7	210.9	lava and basalt trap	Basalt	--	--	--	
158	7/8-24A4			692	702	210.9	214.0	blue rock	Sandstone	hard	--	--	
158	7/8-24A4			702	709	214.0	216.1	volcanic ash, red	Ash or tuff	--	--	--	
158	7/8-24A4			709	734	216.1	223.7	rock, blue	Sandstone	hard	--	--	
158	7/8-24A4			734	745	223.7	227.1	clay, blue, and boulders	Clay and gravel	--	--	--	
158	7/8-24A4			745	755	227.1	230.1	rock	Ash or tuff	hard	--	--	
158	7/8-24A4			755	770	230.1	234.7	clay, blue	Clay	--	--	--	
158	7/8-24A4			770	810	234.7	246.9	gravel cemented	Gravel	cemented	--	--	
158	7/8-24A4			810	842	246.9	256.6	limestone	Clay and sand (or sandstone)	--	--	--	
158	7/8-24A4			842	850	256.6	259.1	sandstone	Sandstone	cemented	--	--	
158	7/8-24A4			850	888	259.1	270.7	volcanic clay, red	Ash or tuff	--	--	--	
158	7/8-24A4			888	931	270.7	283.8	rock, blue	Sandstone	hard	--	--	
158	7/8-24A4			931	935	283.8	285.0	volcanic ash, red	Ash or tuff	--	--	--	
158	7/8-24A4			935	940	285.0	286.5	clay, red, and boulders	Clay and gravel	--	--	--	
158	7/8-24A4			940	975	286.5	297.2	rock	Ash or tuff	hard	--	--	
158	7/8-24A4			975	982	297.2	299.3	clay, blue, and boulders	Clay and gravel	--	--	--	
158	7/8-24A4			982	998	299.3	304.2	clay, blue and gray	Clay	--	--	--	
158	7/8-24A4			998	1000	304.2	304.8	rock	Ash or tuff	hard	--	--	
								soil (described in log of well 7/7-24B1 as yellow clay and boulders, 1-18 feet, and brown clay and					
159	7/7-24A1	159	7/7-24A1	0	80	0.0	24.4	gravel, 18-90 feet)	Clay, sand, and gravel	--	--	--	QTge
159	7/7-24A1			80	120	24.4	36.6	rock, soft, brown	Ash or tuff	hard	--	--	Tsv
159	7/7-24A1			120	208	36.6	63.4	soft red rock	Ash or tuff	--	--	--	
159	7/7-24A1			208	222	63.4	67.7	dark brown rock	Ash or tuff	--	--	--	
159	7/7-24A1			222	281	67.7	85.6	hard red rock with many seams	Ash or tuff	--	--	--	
159	7/7-24A1			281	434	85.6	132.3	hard brown rock with many seams	Ash or tuff	hard	--	--	
159	7/7-24A1			434	488	132.3	148.7	soft yellow-brown rock with many	Ash or tuff	--	--	--	
159	7/7-24A1			488	580	148.7	176.8	seams	Ash or tuff	--	--	--	
159	7/7-24A1			580	620	176.8	189.0	hard red rock, very seamy	Ash or tuff	hard	--	--	
159	7/7-24A1			620	622	189.0	189.6	harder red rock, very seamy	Ash or tuff	hard	--	--	
160	7/9-21G2	160	7/9-21G2	0	240	0.0	73.2	no data	No data	--	--	--	--
161	7/7-23A2	161	7/7-23A2	0	2	0.0	0.6	topsoil	Sand and clay	--	--	--	Qyal and QTge
161	7/7-23A2			2	179	0.6	54.6	clay, yellow, and gravel	Clay and gravel	--	--	--	
161	7/7-23A2			179	202	54.6	61.6	clay, blue, and gravel	Clay and gravel	--	--	--	
161	7/7-23A2			202	250	61.6	76.2	clay, yellow, and gravel	Clay and gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
161	7/7-23A2			250	256	76.2	78.0	gravel	Gravel	--	--	--	
161	7/7-23A2			256	280	78.0	85.3	clay, yellow, and gravel	Clay and gravel	--	--	--	
161	7/7-23A2			280	304	85.3	92.7	clay, yellow	Clay	--	--	--	
161	7/7-23A2			304	337	92.7	102.7	clay, yellow, and gravel	Clay and gravel	--	--	--	
162	7/9-22F1	162	7/9-22F1	0	42	0.0	12.8	no data	No data	--	--	--	--
162	7/9-22F1			42	257	12.8	78.3	fine sand	Sand	--	--	--	QTm
162	7/9-22F1			257	383	78.3	116.7	no data	No data	--	--	--	
162	7/9-22F1			383	400	116.7	121.9	small boulders with shells	Gravel	--	shells	--	
162	7/9-22F1			400	481	121.9	146.6	no data	No data	--	--	--	
162	7/9-22F1			481	512	146.6	156.1	small boulders with shells	Gravel	--	shells	--	
162	7/9-22F1			512	517	156.1	157.6	no data	No data	--	--	--	
162	7/9-22F1			517	575	157.6	175.3	fine gravel; coarse gravel	Gravel	--	--	--	
163	7/9-22F2	163	7/9-22F2	0	380	0.0	115.8	(no perforations)	No data	--	--	--	QTm
164	7/9-21F1		164	7/9-21F1	0	320	0.0	97.5	no data	No data	--	--	QTm
165	7/9-21G3	165	7/9-21G3	0	390	0.0	118.9	no data	No data	--	--	--	--
165	7/9-21G3			390	408	118.9	124.4	sandstone	Sandstone	cemented	--	--	QTm
166	7/7-23G1		166	7/7-23G1	0	58	0.0	17.7	clay, yellow	Clay	--	--	Qyal and Qoal (?) and QTge
166	7/7-23G1			58	86	17.7	26.2	blue shale	Clay and sand (or sandstone)	cemented	--	--	
166	7/7-23G1			86	115	26.2	35.1	yellow clay	Clay	--	--	--	
166	7/7-23G1			115	126	35.1	38.4	blue clay	Clay	--	--	--	
166	7/7-23G1			126	146	38.4	44.5	blue clay	Clay	--	--	--	
166	7/7-23G1			146	150	44.5	45.7	blue shale and gravel	Clay, sand, and gravel	cemented	--	--	
166	7/7-23G1			150	155	45.7	47.2	blue shale	Clay and sand (or sandstone)	cemented	--	--	
166	7/7-23G1			155	214	47.2	65.2	shale and gravel	Clay and gravel	cemented	--	--	
166	7/7-23G1			214	245	65.2	74.7	shale and sand	Clay and sand (or sandstone)	cemented	--	--	
166	7/7-23G1	166		245	265	74.7	80.8	yellow clay and coarse gravel	Clay and gravel	--	--	--	
166	7/7-23G1			265	278	80.8	84.7	hardpan boulders	Clay and gravel	hard	--	--	
166	7/7-23G1			278	300	84.7	91.4	shale rock	Clay and sand (or sandstone)	cemented	--	--	
166	7/7-23G1			300	302	91.4	92.0	blue shale	Clay and sand (or sandstone)	cemented	--	--	
166	7/7-23G1			302	345	92.0	105.2	shale rock	Clay and sand (or sandstone)	cemented	--	--	
166	7/7-23G1			345	349	105.2	106.4	blue shale	Clay and sand (or sandstone)	cemented	--	--	
166	7/7-23G1			349	370	106.4	112.8	volcanic clay and rock	Ash or tuff	--	--	--	
166	7/7-23G1			370	379	112.8	115.5	gravel cement	Gravel	cemented	--	--	
166	7/7-23G1			379	417	115.5	127.1	gravel and shale	Clay and gravel	cemented	--	--	
166	7/7-23G1			417	445	127.1	135.6	blue shale	Clay and sand (or sandstone)	cemented	--	--	
166	7/7-23G1	166		445	457	135.6	139.3	yellow clay	Clay	--	--	--	
166	7/7-23G1			457	510	139.3	155.4	blue shale	Clay and sand (or sandstone)	cemented	--	--	
166	7/7-23G1			510	515	155.4	157.0	blue clay	Clay	--	--	--	
166	7/7-23G1			515	561	157.0	171.0	shale	Clay and sand (or sandstone)	cemented	--	--	
166	7/7-23G1			561	576	171.0	175.6	shale rock	Clay and sand (or sandstone)	cemented	--	--	
166	7/7-23G1			576	584	175.6	178.0	very hard rock and gravel	Ash or tuff	hard	--	--	
166	7/7-23G1			584	645	178.0	196.6	shale formation	Clay and sand (or sandstone)	cemented	--	--	
166	7/7-23G1			645	672	196.6	204.8	gravel cement very hard	Gravel	cemented	--	--	
166	7/7-23G1			672	840	204.8	256.0	no record	No data	--	--	--	
166	7/7-23G1			840	870	256.0	265.2	coarse gravel	Gravel	--	--	--	
166	7/7-23G1	167		870	885	265.2	269.7	boulders, sand, and gravel	Sand (or sandstone) and gravel	--	--	--	
166	7/7-23G1			885	910	269.7	277.4	boulders and gravel	Gravel	--	--	--	
166	7/7-23G1			910	985	277.4	300.2	fractured basalt rock	Basalt	hard	--	--	Tsv
166	7/7-23G1			985	1005	300.2	306.3	blue shale and gravel	Clay, sand, and gravel	cemented	--	--	
166	7/7-23G1			1005	1015	306.3	309.4	boulders	Gravel	--	--	--	
166	7/7-23G1			1015	1025	309.4	312.4	gray shale and boulders	Clay and gravel	cemented	--	--	
166	7/7-23G1			1025	1055	312.4	321.6	fine gravel	Gravel	--	--	--	
166	7/7-23G1			1055	1065	321.6	324.6	boulders and fine gravel	Gravel	--	--	--	
166	7/7-23G1			1065	1085	324.6	330.7	sandy clay	Clay and sand (or sandstone)	--	--	--	
166	7/7-23G1			1085	1090	330.7	332.2	boulders, lime	Gravel	--	--	--	
166	7/7-23G1	167		1090	1100	332.2	335.3	sandy clay	Clay and sand (or sandstone)	--	--	--	
166	7/7-23G1			1100	1170	335.3	356.6	gray shale	Clay and sand (or sandstone)	cemented	--	--	
167	7/9-21G1		167	7/9-21G1	0	2	0.0	0.6	soil, sandy	Sand and clay	--	--	--
167	7/9-21G1			2	56	0.6	17.1	clay, yellow, sandy	Clay and sand (or sandstone)	--	--	--	
167	7/9-21G1			56	173	17.1	52.7	sand, yellow	Sand	--	--	--	
167	7/9-21G1			173	185	52.7	56.4	clay, yellow, sandy	Clay and sand (or sandstone)	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
167	7/9-21G1			185	186	56.4	56.7	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
167	7/9-21G1			186	205	56.7	62.5	sand, blue	Sand	--	--	--	
167	7/9-21G1			205	244	62.5	74.4	sand, blue, and clam shells	Sand	--	shells	--	
167	7/9-21G1			244	270	74.4	82.3	sand, blue	Sand	--	--	--	
167	7/9-21G1			270	316	82.3	96.3	sand, blue, and clam shells	Sand	--	shells	--	
167	7/9-21G1			316	463	96.3	141.1	sand, blue	Sand	--	--	--	
167	7/9-21G1			463	471	141.1	143.6	sand, blue, and clam shells	Sand	--	shells	--	
167	7/9-21G1			471	496	143.6	151.2	sandstone, blue	Sandstone	cemented	--	--	
167	7/9-21G1			496	499	151.2	152.1	sand, yellow	Sand	--	--	--	
167	7/9-21G1			499	504	152.1	153.6	sandstone, blue	Sandstone	cemented	--	--	
167	7/9-21G1			504	514	153.6	156.7	sand, yellow	Sand	--	--	--	
167	7/9-21G1			514	530	156.7	161.5	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
168	7/9-21J1	168	7/9-21J1	0	195	0.0	59.4	sandstone	Sandstone	cemented	--	--	QTm
168	7/9-21J1			195	205	59.4	62.5	sandstone	Sandstone	cemented	--	--	QTm
169	7/9-23K1	169	7/9-23K1	0	200	0.0	61.0	no data	No data	--	--	--	QTge and QTm
170	7/9-24L2	170	7/9-24L2	0	330	0.0	100.6	no data	No data	--	--	--	QTge and QTm (?)
171	7/8-23L1	171	7/8-23L1	0	48	0.0	14.6	no data	No data	--	--	--	--
171	7/8-23L1			48	52	14.6	15.8	gravel	Gravel	--	--	--	QTge
171	7/8-23L1			52	132	15.8	40.2	no data	No data	--	--	--	
171	7/8-23L1			132	133	40.2	40.5	gravel	Gravel	--	--	--	
171	7/8-23L1			133	273	40.5	83.2	no data	No data	--	--	--	
171	7/8-23L1			273	278	83.2	84.7	gravel	Gravel	--	--	--	
171	7/8-23L1			278	300	84.7	91.4	no data	No data	--	--	--	
172	7/8-24K1	172	7/8-24K1	0	234	0.0	71.3	no data	No data	--	--	--	--
172	7/8-24K1			234	236	71.3	71.9	coarse sand and gravel	Sand (or sandstone) and gravel	--	--	--	QTge
172	7/8-24K1			236	238	71.9	72.5	no data	No data	--	--	--	
173	7/8-23M3	173	7/8-23M3	0	300	0.0	91.4	no data	No data	--	--	--	--
174	7/8-22K1	174	7/8-22K1	0	285	0.0	86.9	no data	No data	--	--	--	QTge
175	7/8-23M4	175	7/8-23M4	0	24	0.0	7.3	clay, sticky	Clay	--	--	--	Qyal and Qoal (?) and QTge
175	7/8-23M4			24	32	7.3	9.8	cemented gravel	Gravel	cemented	--	--	
175	7/8-23M4			32	43	9.8	13.1	clay	Clay	--	--	--	
175	7/8-23M4			43	58	13.1	17.7	gravel	Gravel	--	--	--	
175	7/8-23M4			58	65	17.7	19.8	clay	Clay	--	--	--	
175	7/8-23M4			65	135	19.8	41.1	clay and gravel	Clay and gravel	--	--	--	
175	7/8-23M4			135	145	41.1	44.2	blue clay	Clay	--	--	--	
175	7/8-23M4			145	153	44.2	46.6	clay and gravel	Clay and gravel	--	--	--	
175	7/8-23M4			153	156	46.6	47.5	sandstone	Sandstone	cemented	--	--	QTge (?) and QTm (?)
175	7/8-23M4			156	202	47.5	61.6	clay with gravel	Clay and gravel	--	--	--	
175	7/8-23M4			202	210	61.6	64.0	sandstone	Sandstone	cemented	--	--	
175	7/8-23M4			210	303	64.0	92.4	hard and soft clay and gravel layers	Clay and gravel	hard	--	--	
175	7/8-23M4			303	310	92.4	94.5	sandstone	Sandstone	cemented	--	--	
175	7/8-23M4			310	412	94.5	125.6	layers	Clay and gravel	hard	--	--	
175	7/8-23M4			412	423	125.6	128.9	sandstone	Sandstone	cemented	--	--	
175	7/8-23M4			423	575	128.9	175.3	blue and yellow clay with small amounts of gravel	Clay and gravel	--	--	--	
175	7/8-23M4			575	590	175.3	179.8	volcanic ash	Ash or tuff	--	--	--	
175	7/8-23M4			590	650	179.8	198.1	blue shale	Clay and sand (or sandstone)	cemented	--	--	
175	7/8-23M4			650	655	198.1	199.6	clay and gravel	Clay and gravel	--	--	--	
175	7/8-23M4			655	670	199.6	204.2	volcanic rock	Ash or tuff	--	--	--	Tsv (?) and QTm (?)
175	7/8-23M4			670	805	204.2	245.4	blue clay, shale, and minor amounts of gravel	Clay, sand, and trace gravel	cemented	--	--	
175	7/8-23M4			805	820	245.4	249.9	lava rock	Basalt	hard	--	--	
175	7/8-23M4			820	830	249.9	253.0	blue clay	Clay	--	--	--	
175	7/8-23M4			830	835	253.0	254.5	lava rock	Basalt	hard	--	--	
175	7/8-23M4			835	842	254.5	256.6	clay and lava	Clay and gravel	--	--	--	
175	7/8-23M4			842	878	256.6	267.6	blue clay with "iron" deposit 850-854	Clay	--	--	--	
175	7/8-23M4			878	883	267.6	269.1	cement gravel, water	Gravel	cemented	--	--	
175	7/8-23M4			883	920	269.1	280.4	blue clay with gravel	Clay and gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
175	7/8-23M4			920	925	280.4	281.9	clay, sand, and gravel blue clay with some gravel and rock	Clay, sand, and gravel	--	--	--	
175	7/8-23M4			925	970	281.9	295.7	hard yellow clay	Clay and gravel	hard	--	--	
175	7/8-23M4			970	981	295.7	299.0	clay, gravel, sand, limestone(?) and lava	Clay	hard	--	--	
175	7/8-23M4			981	1279	299.0	389.8	no data	Clay, sand, and gravel	--	--	--	
176	7/8-19P1	176	7/8-19P1	0	20	0.0	6.1	No data	No data	--	--	--	
176	7/8-19P1			20	32	6.1	9.8	sand; gravel	Sand (or sandstone) and gravel	--	--	--	QTge
176	7/8-19P1			32	45	9.8	13.7	no data	No data	--	--	--	
176	7/8-19P1			45	65	13.7	19.8	gravel; cemented gravel	Gravel	cemented	--	--	
176	7/8-19P1			65	150	19.8	45.7	no data	No data	--	--	--	QTm
176	7/8-19P1			150	180	45.7	54.9	sand, gravel; sand, sediment	Sand (or sandstone) and gravel	--	--	--	
176	7/8-19P1			180	219	54.9	66.8	no data	No data	--	--	--	
176	7/8-19P1			219	235	66.8	71.6	gravel	Gravel	--	--	--	QTge
176	7/8-19P1			235	245	71.6	74.7	no data	No data	--	--	--	
177	7/8-20K1	177	7/8-20K1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Qyal
177	7/8-20K1			4	16	1.2	4.9	yellow clay and gravel	Clay and gravel	--	--	--	QTge
177	7/8-20K1			16	35	4.9	10.7	yellow clay	Clay	--	--	--	
177	7/8-20K1			35	60	10.7	18.3	blue clay	Clay	--	--	--	
177	7/8-20K1			60	65	18.3	19.8	yellow clay and gravel	Clay and gravel	--	--	--	
177	7/8-20K1			65	79	19.8	24.1	yellow clay	Clay	--	--	--	
177	7/8-20K1			79	84	24.1	25.6	gravel	Gravel	--	--	--	
177	7/8-20K1			84	99	25.6	30.2	sandy yellow clay	Clay and sand (or sandstone)	--	--	--	
177	7/8-20K1			99	110	30.2	33.5	blue clay	Clay	--	--	--	
177	7/8-20K1			110	120	33.5	36.6	gravel	Gravel	--	--	--	
177	7/8-20K1			120	123	36.6	37.5	yellow cement	Clay, sand, and gravel	cemented	--	--	
177	7/8-20K1			123	145	37.5	44.2	yellow clay	Clay	--	--	--	
177	7/8-20K1			145	170	44.2	51.8	blue clay	Clay	--	--	--	
177	7/8-20K1			170	173	51.8	52.7	yellow sand and gravel	Sand (or sandstone) and gravel	--	--	--	
177	7/8-20K1			173	185	52.7	56.4	yellow clay	Clay	--	--	--	
177	7/8-20K1			185	198	56.4	60.4	sandy yellow clay	Clay and sand (or sandstone)	--	--	--	
177	7/8-20K1			198	215	60.4	65.5	blue clay	Clay	--	--	--	
177	7/8-20K1			215	256	65.5	78.0	yellow clay	Clay	--	--	--	
177	7/8-20K1			256	308	78.0	93.9	blue clay	Clay	--	--	--	
177	7/8-20K1			308	324	93.9	98.8	blue clay and little mixed gravel	Clay and gravel	--	--	--	
177	7/8-20K1			324	462	98.8	140.8	blue clay	Clay	--	--	--	
177	7/8-20K1			462	471	140.8	143.6	sandy blue clay	Clay and sand (or sandstone)	--	--	--	
177	7/8-20K1			471	557	143.6	169.8	blue clay and gravel, mixed	Clay and gravel	--	--	--	
177	7/8-20K1			557	615	169.8	187.5	blue clay and gravel, mixed	Clay and gravel	--	--	--	
177	7/8-20K1			615	626	187.5	190.8	blue clay and little gravel	Clay and gravel	--	--	--	
178	7/9-24J1	178	7/9-24J1	0	38	0.0	11.6	brown, sandy clay	Clay and sand (or sandstone)	--	--	--	QTge
178	7/9-24J1			38	45	11.6	13.7	brown, sandy clay	Clay and sand (or sandstone)	--	--	--	
178	7/9-24J1			45	82	13.7	25.0	blue sand and clay	Sand and clay	--	--	--	
178	7/9-24J1			82	86	25.0	26.2	black clay	Clay	--	--	--	
178	7/9-24J1			86	130	26.2	39.6	blue sand and clay	Sand and clay	--	--	--	
178	7/9-24J1			130	135	39.6	41.1	gray sand and gravel	Sand (or sandstone) and gravel	--	--	--	
178	7/9-24J1			135	160	41.1	48.8	gray sand and clay	Sand and clay	--	--	--	
178	7/9-24J1			160	171	48.8	52.1	brown and blue clay	Clay	--	--	--	
178	7/9-24J1			171	195	52.1	59.4	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
178	7/9-24J1			195	255	59.4	77.7	blue clay and blue sand	Clay and sand (or sandstone)	--	--	--	QTm
178	7/9-24J1			255	279	77.7	85.0	hard sand and clay	Sand and clay	hard	--	--	
178	7/9-24J1			279	285	85.0	86.9	coarse gravel	Gravel	--	--	--	
178	7/9-24J1			285	370	86.9	112.8	blue clay and blue sand	Clay and sand (or sandstone)	--	--	--	
178	7/9-24J1			370	543	112.8	165.5	blue clay and shale	Clay and sand (or sandstone)	cemented	--	--	
178	7/9-24J1			543	565	165.5	172.2	blue sand and shale	Sand and clay	cemented	--	--	
178	7/9-24J1			565	575	172.2	175.3	brown shale	Clay and sand (or sandstone)	cemented	--	--	
178	7/9-24J1			575	615	175.3	187.5	blue shale and sand	Clay and sand (or sandstone)	cemented	--	--	
178	7/9-24J1			615	695	187.5	211.8	shale and boulders	Clay and gravel	cemented	--	--	QTge (?)
178	7/9-24J1			695	705	211.8	214.9	shale and showing of wood	Clay and sand (or sandstone)	cemented	--	wood	
178	7/9-24J1			705	740	214.9	225.6	hard shale	Clay and sand (or sandstone)	hard	--	--	
178	7/9-24J1			740	760	225.6	231.6	shale with brown sandy streaks	Clay and sand (or sandstone)	cemented	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
178	7/9-24J1			760	800	231.6	243.8	black coarse gravel	Gravel	--	--	--	
178	7/9-24J1			800	826	243.8	251.8	shale and boulders	Clay and gravel	cemented	--	--	
								shale and limestone streaks, shells					
178	7/9-24J1			826	920	251.8	280.4		Clay and sand (or sandstone)	cemented	shells	--	QTm
178	7/9-24J1			920	970	280.4	295.7	black gravel and sand	Sand (or sandstone) and gravel	--	--	--	
178	7/9-24J1			970	1190	295.7	362.7	shale and limestone streaks	Clay and sand (or sandstone)	cemented	--	--	
178	7/9-24J1			1190	1220	362.7	371.9	very hard shale and limestone	Clay and sand (or sandstone)	hard	--	--	
178	7/9-24J1			1220	1265	371.9	385.6	sand, shale, and boulders	Clay, sand, and gravel	cemented	--	--	
178	7/9-24J1			1265	1280	385.6	390.1	small black boulders, sand	Sand (or sandstone) and gravel	--	--	--	
178	7/9-24J1			1280	1468	390.1	447.4	sand and shale with lime streaks	Sand and clay	cemented	--	--	
178	7/9-24J1			1468	1475	447.4	449.6	sandy shale and wood	Clay and sand (or sandstone)	cemented	--	wood	
178	7/9-24J1			1475	1520	449.6	463.3	hard black shale and sand	Clay and sand (or sandstone)	hard	--	--	
178	7/9-24J1			1520	1555	463.3	474.0	very hard shale	Clay and sand (or sandstone)	hard	--	--	
178	7/9-24J1			1555	1574	474.0	479.8	blue sand and brown shale	Sand and clay	cemented	--	--	
178	7/9-24J1			1574	1666	479.8	507.8	clay and limestone streaks	Clay and sand (or sandstone)	--	--	--	
178	7/9-24J1			1666	1686	507.8	513.9	blue sand and shale	Sand and clay	cemented	--	--	
178	7/9-24J1			1686	1879	513.9	572.7	shale and limestone shelves	Clay and sand (or sandstone)	cemented	--	--	
178	7/9-24J1			1879	1905	572.7	580.6	blue shale and hard black shale	Clay and sand (or sandstone)	hard	--	--	
178	7/9-24J1			1905	1955	580.6	595.9	blue shale and limestone	Clay, sand, and gravel	cemented	--	--	
178	7/9-24J1			1955	2053	595.9	625.8	blue sandy shale, limestone shells Interbedded sand and limestone in wafer-like sections, 1/2 - 1 inch thick	Clay and sand (or sandstone)	cemented	shells	--	
178	7/9-24J1			2053	2076	625.8	632.8		Clay and sand (or sandstone)	--	--	--	
179	7/8-22R2	179	7/8-22R2	0	205	0.0	62.5	no data	No data	--	--	--	--
180	7/8-23M1	180	7/8-23M1	0	6	0.0	1.8	soil, black, adobe	Sand and clay	--	--	--	Qyal and Qoal (?) and QTge
180	7/8-23M1			6	24	1.8	7.3	clay, yellow	Clay	--	--	--	
180	7/8-23M1			24	54	7.3	16.5	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
								clay, yellow; include sand and gravel streaks					
180	7/8-23M1			54	106	16.5	32.3		Clay, sand, and gravel	--	--	--	
180	7/8-23M1			106	120	32.3	36.6	gravel, pea	Gravel	--	--	--	
180	7/8-23M1			120	156	36.6	47.5	clay, gray	Clay	--	--	--	
180	7/8-23M1			156	216	47.5	65.8	clay, yellow, sandy	Clay and sand (or sandstone)	--	--	--	QTm (?) and QTge (?)
180	7/8-23M1			216	320	65.8	97.5	clay, yellow, sandy	Clay and sand (or sandstone)	--	--	--	
180	7/8-23M1			320	335	97.5	102.1	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
180	7/8-23M1			335	356	102.1	108.5	clay, yellow, sandy	Clay and sand (or sandstone)	--	--	--	
180	7/8-23M1			356	380	108.5	115.8	clay, yellow	Clay	--	--	--	
								clay, yellow, sandy; includes gravel streaks					
180	7/8-23M1			380	442	115.8	134.7		Clay, sand, and gravel	--	--	--	
180	7/8-23M1			442	500	134.7	152.4	streaks	Clay and gravel	--	--	--	
180	7/8-23M1			500	530	152.4	161.5	sand, brown	Sand	--	--	--	
180	7/8-23M1			530	627	161.5	191.1	sand and pea gravel	Sand (or sandstone) and gravel	--	--	--	
180	7/8-23M1			627	700	191.1	213.4	clay, yellow	Clay	--	--	--	
180	7/8-23M1			700	751	213.4	228.9	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
180	7/8-23M1			751	814	228.9	248.1	sand	Sand	--	--	--	
180	7/8-23M1			814	955	248.1	291.1	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
180	7/8-23M1			955	970	291.1	295.7	sand	Sand	--	--	--	
180	7/8-23M1			970	1000	295.7	304.8	shale, blue	Clay and sand (or sandstone)	cemented	--	--	
181	7/8-22Q1	181	7/8-22Q1	0	360	0.0	109.7	no data	No data	--	--	--	--
182	7/9-30A1	182	7/9-30A1	0	260	0.0	79.2	no data	No data	--	--	--	QTm
183	7/8-23P1	183	7/8-23P1	0	90	0.0	27.4	no data	No data	--	--	--	--
183	7/8-23P1			90	95	27.4	29.0	clay and gravel	Clay and gravel	--	--	--	QTge
183	7/8-23P1			95	116	29.0	35.4	no data	No data	--	--	--	
								clay and gravel; cemented gravel;					
183	7/8-23P1			116	138	35.4	42.1	gravel	Clay and gravel	cemented	--	--	QTge
183	7/8-23P1			138	258	42.1	78.6	no data	No data	--	--	--	
183	7/8-23P1			258	264	78.6	80.5	clay and gravel	Clay and gravel	--	--	--	QTge
183	7/8-23P1			264	266	80.5	81.1	no data	No data	--	--	--	
184	7/6-19R1	184	7/6-19R1	0	3	0.0	0.9	soil, small, brown, gravelly	Sand and clay	--	--	--	Qoal (?) and QTge

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
184	7/6-19R1			3	35	0.9	10.7	medium yellow gravelly clay	Clay and gravel	--	--	--	
184	7/6-19R1			35	40	10.7	12.2	fine packed gravel	Gravel	--	--	--	
184	7/6-19R1			40	110	12.2	33.5	medium gravelly yellow clay	Clay	--	--	--	
								medium yellow packed gravel,					
184	7/6-19R1			110	120	33.5	36.6	small amount of water	Gravel	--	--	--	
184	7/6-19R1			120	200	36.6	61.0	soft yellow shaley rock	Clay and sand (or sandstone)	--	--	--	
								small yellow boulders and coarse					
184	7/6-19R1			200	220	61.0	67.1	sand, water strata	Sand (or sandstone) and gravel	--	--	--	
184	7/6-19R1			220	260	67.1	79.2	hard yellow volcanic ash	Ash or tuff	hard	--	--	
								blue volcanic ash, water in a large					
								quantity					
184	7/6-19R1			260	300	79.2	91.4		Ash or tuff	--	--	--	Tsv (?)
185	7/6-19N1	185	7/6-19N1	0	1	0.0	0.3	soil	Sand and clay	--	--	--	Qyal and QTge (?)
185	7/6-19N1			1	4	0.3	1.2	gravel, coarse yellow	Gravel	--	--	--	
185	7/6-19N1			4	6	1.2	1.8	brown silt	Sand and clay	--	--	--	
185	7/6-19N1			6	21	1.8	6.4	yellow clay and small gravel	Clay and gravel	--	--	--	
185	7/6-19N1			21	25	6.4	7.6	coarse packed gravel	Gravel	--	--	--	
185	7/6-19N1			25	28	7.6	8.5	sandy yellow clay	Clay and sand (or sandstone)	--	--	--	
185	7/6-19N1			28	34	8.5	10.4	coarse gravel and yellow clay	Sand (or sandstone) and gravel	--	--	--	
								blue clay and small gravel water					
185	7/6-19N1			34	37	10.4	11.3	strata	Clay and gravel	--	--	--	
185	7/6-19N1			37	57	11.3	17.4	coarse gravelly yellow clay	Clay and gravel	--	--	--	
185	7/6-19N1			57	87	17.4	26.5	small boulders and yellow clay	Clay and gravel	--	--	--	
185	7/6-19N1			87	112	26.5	34.1	coarse gravelly yellow clay	Clay and gravel	--	--	--	
185	7/6-19N1			112	118	34.1	36.0	blue clay and small boulders	Clay and gravel	--	--	--	
185	7/6-19N1			118	125	36.0	38.1	small boulders and yellow clay	Clay and gravel	--	--	--	
185	7/6-19N1			125	130	38.1	39.6	yellow shaley rock	Clay and sand (or sandstone)	--	--	--	
185	7/6-19N1			130	140	39.6	42.7	coarse gravelly yellow clay	Clay and gravel	--	--	--	
185	7/6-19N1			140	145	42.7	44.2	fine gravelly yellow clay	Sand (or sandstone) and gravel	--	--	--	
185	7/6-19N1			145	149	44.2	45.4	coarse packed gravel water strata	Gravel	--	--	--	
186	7/9-25A1A	186	7/9-25A1A	0	20	0.0	6.1	no data	No data	--	--	--	
186	7/9-25A1A			20	30	6.1	9.1	clay and gravel	Clay and gravel	--	--	--	QTge
186	7/9-25A1A			30	65	9.1	19.8	no data	No data	--	--	--	
186	7/9-25A1A			65	85	19.8	25.9	gravel	Gravel	--	--	--	
186	7/9-25A1A			85	86	25.9	26.2	no data	No data	--	--	--	
187	7/9-25A1B	187	7/9-25A1B	0	90	0.0	27.4	no data	No data	--	--	--	--
187	7/9-25A1B			90	106	27.4	32.3	sand	Sand	--	--	--	QTm
187	7/9-25A1B			106	190	32.3	57.9	no data	No data	--	--	--	
187	7/9-25A1B			190	206	57.9	62.8	sand	Sand	--	--	--	
187	7/9-25A1B			206	256	62.8	78.0	no data	No data	--	--	--	
188	7/9-30G2	188	7/9-30G2	0	200	0.0	61.0	(cased to 114 ft.)	No data	--	--	--	QTm
189	7/7-29D1	189	7/7-29D1	0	15	0.0	4.6	adobe and yellow clay	Sand and clay	--	--	--	Qyal and QTge (?)
								clay, yellow, becoming sandy at bottom					
189	7/7-29D1			15	40	4.6	12.2	loose gravel	Clay and sand (or sandstone)	--	--	--	
189	7/7-29D1			40	60	12.2	18.3	blue shale, hard streak of sand	Gravel	--	--	--	
189	7/7-29D1			60	130	18.3	39.6	sand and gravel	Clay and sand (or sandstone)	hard	--	--	
189	7/7-29D1			130	160	39.6	48.8	blue shale, fine sand, and gravel; bottom basaltic boulders as in order	Sand (or sandstone) and gravel	--	--	--	
189	7/7-29D1			160	180	48.8	54.9	basalt, shows vesicular under glass	Clay and sand (or sandstone)	cemented	--	--	Tsv
189	7/7-29D1			180	260	54.9	79.2	top of basalt, drills very hard first foot	Basalt	--	--	--	
189	7/7-29D1			180	180	54.9	54.9	basalt, dense, hard drilling	Basalt	hard	--	--	
189	7/7-29D1			260	270	79.2	82.3	basalt, vesicular	Basalt	hard	--	--	
189	7/7-29D1			270	300	82.3	91.4	red ash	Basalt	--	--	--	
189	7/7-29D1			300	310	91.4	94.5	basalt, vesicular	Ash or tuff	--	--	--	
189	7/7-29D1			310	340	94.5	103.6	basalt, hard drilling	Basalt	--	--	--	
189	7/7-29D1			340	350	103.6	106.7	basalt, drilled like fractured, but it is vesicular under glass	Basalt	hard	--	--	
189	7/7-29D1			350	400	106.7	121.9	Basalt	--	--	--		

**Appendix 3. Lithologic data. —Continued**

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
189	7/7-29D1			400	410	121.9	125.0	red vesicular lava gray ash, appears to have had stream action; drilled a foot per	Basalt	--	--	--	
189	7/7-29D1			410	540	125.0	164.6	minute	Ash or tuff	--	--	--	
189	7/7-29D1			540	550	164.6	167.6	basalt, very hard	Basalt	hard	--	--	
189	7/7-29D1			550	570	167.6	173.7	basalt, vesicular	Basalt	--	--	--	
189	7/7-29D1			570	588	173.7	179.2	basalt, dense	Basalt	--	--	--	
190	7/9-27E2	190	7/9-27E2	0	47	0.0	14.3	no data	No data	--	--	--	--
190	7/9-27E2			47	90	14.3	27.4	sand and gravel; quicksand.	Sand (or sandstone) and gravel	--	--	--	
190	7/9-27E2			90	370	27.4	112.8	sandstone; gravel and sand.	Sand (or sandstone) and gravel	cemented	--	--	QTm
191	7/9-27F1	191	7/9-27F1	0	200	0.0	61.0	no data	No data	--	--	--	QTm
192	7/7-30C1	192	7/7-30C1	0	5	0.0	1.5	topsoil, adobe	Sand and clay	--	--	--	QTge and QTm (?)
192	7/7-30C1			5	75	1.5	22.9	boulders, hard	Gravel	hard	--	--	
192	7/7-30C1			75	93	22.9	28.3	coarse sand	Sand	--	--	--	
192	7/7-30C1			93	98	28.3	29.9	blue clay	Clay	--	--	--	
192	7/7-30C1			98	122	29.9	37.2	rock	Ash or tuff	hard	--	--	
192	7/7-30C1			122	138	37.2	42.1	coarse sand	Sand	--	--	peat	
192	7/7-30C1			138	140	42.1	42.7	blue clay	Clay	--	--	--	
192	7/7-30C1			140	148	42.7	45.1	rock	Ash or tuff	hard	--	--	
192	7/7-30C1							blue clay with streaks of sand and gravel	Clay, sand, and gravel	--	--	--	
192	7/7-30C1			148	310	45.1	94.5	coarse sand	Sand	--	--	--	
192	7/7-30C1			310	320	94.5	97.5	blue clay with streaks of sand and gravel	Clay, sand, and gravel	--	--	--	
192	7/7-30C1			320	342	97.5	104.2	coarse sand	Sand	--	--	--	
192	7/7-30C1			342	360	104.2	109.7	blue clay	Clay	--	--	--	
192	7/7-30C1			360	365	109.7	111.3	blue sandstone with shells	Sandstone	cemented	shells	--	
192	7/7-30C1			365	375	111.3	114.3	blue clay	Clay	--	--	--	
192	7/7-30C1			375	377	114.3	114.9	gravel, sand, streaks of sandstone with shells	Sand (or sandstone) and gravel	cemented	shells	--	
192	7/7-30C1			377	385	114.9	117.3	coarse sand	Sand	--	--	--	
192	7/7-30C1			385	397	117.3	121.0	blue clay	Clay	--	--	--	
192	7/7-30C1			397	400	121.0	121.9	coarse sand	Sand	--	--	--	
192	7/7-30C1			400	408	121.9	124.4	blue clay	Clay	--	--	--	
192	7/7-30C1			408	410	124.4	125.0	blue clay	Sand	--	--	--	
192	7/7-30C1			410	422	125.0	128.6	brown clay	Clay	--	--	--	
192	7/7-30C1			422	442	128.6	134.7	blue clay	Clay	--	--	--	
192	7/7-30C1			442	448	134.7	136.6	hard rock (probably basalt)	Basalt	hard	--	--	Tsv
193	7/9-28G1	193	7/9-28G1	0	90	0.0	27.4	no data	No data	--	--	--	
193	7/9-28G1			90	260	27.4	79.2	sandstone	Sandstone	cemented	--	--	QTm
194	7/9-28G2	194	7/9-28G2	0	40	0.0	12.2	no data	No data	--	--	--	
194	7/9-28G2			40	240	12.2	73.2	sandstone; sandstone and clam shells	Sandstone	cemented	shells	--	QTm
195	7/9-27E1	195	7/9-27E1	0	12	0.0	3.7	no data	No data	--	--	--	
195	7/9-27E1			12	260	3.7	79.2	sandstone and clam shells; sand and gravel; sand.	Sand (or sandstone) and gravel	cemented	shells	--	QTm
196	7/9-30J1	196	7/9-30J1	0	160	0.0	48.8	no data	No data	--	--	--	
196	7/9-30J1			160	200	48.8	61.0	sandstone	Sandstone	cemented	--	--	QTm
197	7/9-26M1	197	7/9-26M1	0	206	0.0	62.8	no data	No data	--	--	--	QTm
198	7/8-28F1	198	7/8-28F1	0	5	0.0	1.5	adobe	Sand and clay	--	--	--	QTge
198	7/8-28F1			5	15	1.5	4.6	hardpan	Clay and gravel	hard	--	--	
198	7/8-28F1			15	30	4.6	9.1	clay, sticky brown, and gravel; water at 15 feet	Clay and gravel	--	--	--	
198	7/8-28F1			30	55	9.1	16.8	blue clay	Clay	--	--	--	
198	7/8-28F1			55	64	16.8	19.5	gravel	Gravel	--	--	--	
198	7/8-28F1			64	66	19.5	20.1	brown clay	Clay	--	--	--	
199	7/9-28L1	199	7/9-28L1	5	542	1.5	165.2	casing)	Sandstone	cemented	--	--	QTm
200	7/9-29J1	200	7/9-29J1	0	400	0.0	121.9	uncased below 60 ft	No data	--	--	--	QTm
201	7/8-25L1	201	7/8-25L1	0	270	0.0	82.3	no data	No data	--	--	--	
201	7/8-25L1			270	370	82.3	112.8	perforated intervals	No data	--	--	--	Tsv (?)
201	7/8-25L1			370	545	112.8	166.1	no data	No data	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
201	7/8-25L1			545	745	166.1	227.1	perforated intervals	No data	--	--	--	QTge
202	7/8-29R1	202	7/8-29R1	0	110	0.0	33.5	no data	No data	--	--	--	--
202	7/8-29R1			110	120	33.5	36.6	cemented gravel	Gravel	cemented	--	--	QTge
202	7/8-29R1			120	130	36.6	39.6	no data	No data	--	--	--	
202	7/8-29R1			130	145	39.6	44.2	clay, gravel, boulders	Clay and gravel	--	--	--	
202	7/8-29R1			145	150	44.2	45.7	no data	No data	--	--	--	
202	7/8-29R1			150	157	45.7	47.9	sandy clay and gravel	Clay, sand, and gravel	--	--	--	
202	7/8-29R1			157	175	47.9	53.3	no data	No data	--	--	--	
202	7/8-29R1			175	197	53.3	60.0	clay and gravel	Clay and gravel	--	--	--	
202	7/8-29R1			197	236	60.0	71.9	no data	No data	--	--	--	
202	7/8-29R1			236	253	71.9	77.1	cemented gravel	Gravel	cemented	--	--	
202	7/8-29R1			253	650	77.1	198.1	no data	No data	--	--	--	
202	7/8-29R1			650	679	198.1	207.0	fine free gravel; sandy sediment	Sand (or sandstone) and gravel	--	--	--	
202	7/8-29R1			679	682	207.0	207.9	no data	No data	--	--	--	
203	7/8-29R2	203	7/8-29R2	0	801	0.0	244.1	no data	No data	--	--	--	--
204	7/9-29J2	204	7/9-29J2	0	23	0.0	7.0	topsoil; sandy loam	Sand and clay	--	--	--	Qyal
204	7/9-29J2			23	46	7.0	14.0	blue clay	Clay	--	--	--	
								blue sandstone with occasional hard streaks of hard gray					
204	7/9-29J2			46	499	14.0	152.1	sandstone	Sandstone	hard	--	--	QTm
204	7/9-29J2			499	519	152.1	158.2	blue clay	Clay	--	--	--	
204	7/9-29J2			519	532	158.2	162.2	hard sand rock	Sandstone	hard	--	--	
204	7/9-29J2			532	548	162.2	167.0	sandy blue clay	Clay and sand (or sandstone)	--	--	--	
204	7/9-29J2			548	580	167.0	176.8	blue sand with shells	Sand	--	shells	--	
204	7/9-29J2			580	657	176.8	200.3	blue sandstone	Sandstone	cemented	--	--	
205	7/9-28P1	205	7/9-28P1	0	585	0.0	178.3	Uncased below 100 ft)	No data	--	--	--	QTm
206	7/8-29J1	206	7/8-29J1	0	4	0.0	1.2	topsoil and sediment	Sand and clay	--	--	--	QTge
206	7/8-29J1			4	10	1.2	3.0	clay soft, brown	Clay	--	--	--	
206	7/8-29J1			10	12	3.0	3.7	sand, brown, coarse	Sand	--	--	--	
206	7/8-29J1			12	16	3.7	4.9	sand black, fine	Sand	--	--	--	
206	7/8-29J1			16	29	4.9	8.8	clay, blue, some gravel	Clay and gravel	--	--	--	
206	7/8-29J1			29	50	8.8	15.2	clay, soft blue	Clay	--	--	--	
206	7/8-29J1			50	54	15.2	16.5	gravel, tight, cemented	Gravel	cemented	--	--	
								gravel, tight; clay, sticky; shale,					
206	7/8-29J1			54	65	16.5	19.8	black	Clay and gravel	cemented	--	--	
206	7/8-29J1			65	71	19.8	21.6	gravel	Gravel	--	--	--	
206	7/8-29J1			71	75	21.6	22.9	clay	Clay	--	--	--	
								gravel, small, and sand; shale,					
206	7/8-29J1			75	79	22.9	24.1	black; good	Clay, sand, and gravel	cemented	--	--	
206	7/8-29J1			79	84	24.1	25.6	clay	Clay	--	--	--	
								gravel, medium, loose; shale,					
206	7/8-29J1			84	86	25.6	26.2	black, fair	Clay and gravel	cemented	--	--	
206	7/8-29J1			86	92	26.2	28.0	clay, hard	Clay	hard	--	--	
206	7/8-29J1			92	95	28.0	29.0	clay and gravel	Clay and gravel	--	--	--	
206	7/8-29J1			95	100	29.0	30.5	clay	Clay	--	--	--	
206	7/8-29J1			100	103	30.5	31.4	gravel, small, free	Gravel	--	--	--	
206	7/8-29J1			103	110	31.4	33.5	clay, hard	Clay	hard	--	--	
206	7/8-29J1			110	115	33.5	35.1	clay and gravel	Clay and gravel	--	--	--	
206	7/8-29J1			115	121	35.1	36.9	clay	Clay	--	--	--	
206	7/8-29J1			121	128	36.9	39.0	clay and some gravel	Clay and gravel	--	--	--	
206	7/8-29J1			128	131	39.0	39.9	gravel and clay; poor	Clay and gravel	--	--	--	
206	7/8-29J1			131	136	39.9	41.5	gravel, light, with clay	Clay and gravel	--	--	--	
206	7/8-29J1			136	138	41.5	42.1	gravel, light, with clay	Clay and gravel	--	--	--	
206	7/8-29J1			138	184	42.1	56.1	clay, sticky and hard	Clay	hard	--	--	
206	7/8-29J1			184	188	56.1	57.3	clay, soft	Clay	--	--	--	
206	7/8-29J1			188	189	57.3	57.6	gravel, loose; fair	Gravel	--	--	--	
206	7/8-29J1			189	191	57.6	58.2	clay, soft	Clay	--	--	--	
206	7/8-29J1			191	227	58.2	69.2	clay, hard	Clay	hard	--	--	
								gravel, small, and sand; good					
206	7/8-29J1			227	234	69.2	71.3	colors; good	Sand (or sandstone) and gravel	--	--	--	
206	7/8-29J1			234	236	71.3	71.9	gravel and clay; poor	Clay and gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
206	7/8-29J1			236	246	71.9	75.0	clay with streaks of gravel gravel, medium, loose; good colors; good	Clay and gravel	--	--	--	
206	7/8-29J1			246	252	75.0	76.8	gravel, tight, and clay	Gravel	--	--	--	
206	7/8-29J1			252	256	76.8	78.0	clay, hard, sticky	Clay and gravel	--	--	--	
206	7/8-29J1			256	306	78.0	93.3	gravel, small, and clay, soft	Clay	hard	--	--	
206	7/8-29J1			306	309	93.3	94.2	clay, hard, sticky	Clay and gravel	--	--	--	
206	7/8-29J1			309	344	94.2	104.9	clay, hard, sticky	Clay	hard	--	--	
206	7/8-29J1			344	345	104.9	105.2	gravel and clay; poor	Clay and gravel	--	--	--	
206	7/8-29J1			345	355	105.2	108.2	clay	Clay	--	--	--	
206	7/8-29J1			355	357	108.2	108.8	gravel and clay; poor	Clay and gravel	--	--	--	
206	7/8-29J1			357	360	108.8	109.7	clay, soft	Clay	--	--	--	
206	7/8-29J1			360	366	109.7	111.6	gravel, medium; fair	Gravel	--	--	--	
206	7/8-29J1			366	408	111.6	124.4	clay, hard, with soft streaks of white clay	Clay	hard	--	--	
206	7/8-29J1			408	430	124.4	131.1	clay, hard, sticky, with streaks of gravel and soft clay	Clay and gravel	hard	--	--	
206	7/8-29J1			430	432	131.1	131.7	clay, soft	Clay	--	--	--	
206	7/8-29J1			432	434	131.7	132.3	gravel and sand; fair	Sand (or sandstone) and gravel	--	--	--	
206	7/8-29J1			434	435	132.3	132.6	clay and gravel	Clay and gravel	--	--	--	
206	7/8-29J1			435	443	132.6	135.0	sand and small gravel, fair	Sand (or sandstone) and gravel	--	--	--	
206	7/8-29J1			443	450	135.0	137.2	clay, hard, cemented	Clay	cemented	--	--	
206	7/8-29J1			450	453	137.2	138.1	clay, soft	Clay	--	--	--	
206	7/8-29J1			453	456	138.1	139.0	sand and gravel; fair	Sand (or sandstone) and gravel	--	--	--	
206	7/8-29J1			456	472	139.0	143.9	sandy clay and gravel; poor	Clay, sand, and gravel	--	--	--	
206	7/8-29J1			472	476	143.9	145.1	sand and gravel; fair	Sand (or sandstone) and gravel	--	--	--	
206	7/8-29J1			476	515	145.1	157.0	clay hard	Clay	hard	--	--	
206	7/8-29J1			515	536	157.0	163.4	clay, hard, with soft streaks	Clay	hard	--	--	
206	7/8-29J1			536	546	163.4	166.4	clay, soft	Clay	--	--	--	
206	7/8-29J1			546	549	166.4	167.3	gravel, small, and sand; poor	Sand (or sandstone) and gravel	--	--	--	
206	7/8-29J1			549	560	167.3	170.7	clay	Clay	--	--	--	
206	7/8-29J1			560	563	170.7	171.6	sand	Sand	--	--	--	
206	7/8-29J1			563	569	171.6	173.4	gravel, medium; good	Gravel	--	--	--	
206	7/8-29J1			569	591	173.4	180.1	clay, hard, sticky	Clay	hard	--	--	
206	7/8-29J1			591	592	180.1	180.4	clay and gravel	Clay and gravel	--	--	--	
206	7/8-29J1			592	622	180.4	189.6	clay, hard sticky	Clay	hard	--	--	
206	7/8-29J1			622	627	189.6	191.1	gravel, light	Gravel	--	--	--	
206	7/8-29J1			627	632	191.1	192.6	clay and gravel	Clay and gravel	--	--	--	
206	7/8-29J1			632	647	192.6	197.2	clay	Clay	--	--	--	
206	7/8-29J1			647	661	197.2	201.5	gravel, large, loose, good	Gravel	--	--	--	
206	7/8-29J1			661	700	201.5	213.4	clay	Clay	--	--	--	
207	7/8-25R1	207	7/8-25R1	0	30	0.0	9.1	no data	No data	--	--	--	--
207	7/8-25R1	207	7/8-25R1	30	180	9.1	54.9	perforated intervals	No data	--	--	--	Tsv (?)
207	7/8-25R1			180	320	54.9	97.5	no data	No data	--	--	--	
208	7/9-33D2	208	7/9-33D2	0	300	0.0	91.4	no data	No data	--	--	--	QTm
209	7/9-33A1	209	7/9-33A1	0	245	0.0	74.7	no data	No data	--	--	--	QTm
210	7/9-31A1	210	7/9-31A1	0	240	0.0	73.2	no data	No data	--	--	--	QTm
211	7/8-36D2	211	7/8-36D2	0	8	0.0	2.4	soil	Sand and clay	--	--	--	Qyal and QTge
211	7/8-36D2			8	28	2.4	8.5	yellow clay	Clay	--	--	--	
211	7/8-36D2							cemented gravel, first water at 77					
211	7/8-36D2			28	77	8.5	23.5	feet	Gravel	cemented	--	--	
211	7/8-36D2			77	92	23.5	28.0	hard rock	Ash or tuff	hard	--	--	
211	7/8-36D2			92	114	28.0	34.7	rock	Ash or tuff	hard	--	--	
211	7/8-36D2			114	185	34.7	56.4	yellow clay	Clay	--	--	--	
211	7/8-36D2			185	225	56.4	68.6	yellow sandy clay	Clay and sand (or sandstone)	--	--	--	
211	7/8-36D2			225	241	68.6	73.5	clay	Clay	--	--	--	
211	7/8-36D2			241	249	73.5	75.9	coarse sand, water	Sand	--	--	--	
211	7/8-36D2			249	252	75.9	76.8	yellow clay	Clay	--	--	--	
212	7/8-30P1	212	7/8-30P1	0	2	0.0	0.6	soil	Sand and clay	--	--	--	QTge
212	7/8-30P1			2	12	0.6	3.7	hardpan	Clay and gravel	hard	--	--	
212	7/8-30P1			12	15	3.7	4.6	water sand	Sand	--	--	--	
212	7/8-30P1			15	25	4.6	7.6	clay, brown	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
212	7/8-30P1			25	48	7.6	14.6	clay, blue	Clay	--	--	--	
212	7/8-30P1			48	54	14.6	16.5	gravel	Gravel	--	--	--	
212	7/8-30P1			54	63	16.5	19.2	clay, blue	Clay	--	--	--	
212	7/8-30P1			63	72	19.2	21.9	clay, brown	Clay	--	--	--	
212	7/8-30P1			72	76	21.9	23.2	clay, blue	Clay	--	--	--	
212	7/8-30P1			76	123	23.2	37.5	clay, blue	Clay	--	--	--	
212	7/8-30P1			123	142	37.5	43.3	sand and clay	Sand and clay	--	--	--	
212	7/8-30P1			142	145	43.3	44.2	clay, blue	Clay	--	--	--	QTm
212	7/8-30P1			145	164	44.2	50.0	sandstone	Sandstone	cemented	--	--	
212	7/8-30P1			164	178	50.0	54.3	clay and gravel	Clay and gravel	--	--	--	QTge
212	7/8-30P1			178	183	54.3	55.8	gravel, cement	Gravel	cemented	--	--	
212	7/8-30P1			183	205	55.8	62.5	clay, blue	Clay	--	--	--	
213	7/8-31C1	213	7/8-31C1	0	190	0.0	57.9	old well (no record)	No data	--	--	--	QTge
213	7/8-31C1			190	305	57.9	93.0	yellow sandstone	Sandstone	cemented	--	--	QTm
213	7/8-31C1			305	320	93.0	97.5	gravel	Gravel	--	--	--	
214	7/8-35H1	214	7/8-35H1	0	270	0.0	82.3	no data	No data	--	--	--	QTge
215	7/9-34G1	215	7/9-34G1	0	349	0.0	106.4	no data	No data	--	--	--	
215	7/9-34G1			349	358	106.4	109.1	coarse soft sandstone	Sandstone	cemented	--	--	QTm
216	7/9-32F2	216	7/9-32F2	0	365	0.0	111.3	no data	No data	--	--	--	QTm
217	7/9-33F1	217	7/9-33F1	0	200	0.0	61.0	sand, sandstone	Sandstone	cemented	--	--	QTm
218	7/9-35E1	218	7/9-35E1	0	253	0.0	77.1	no data	No data	--	--	--	QTm
219	7/9-32E1	219	7/9-32E1	0	200	0.0	61.0	(Uncased below 6 ft.)	No data	--	--	--	QTm
220	7/9-36H1	220	7/9-36H1	0	2	0.0	0.6	topsoil	Sand and clay	--	--	--	QTge
220	7/9-36H1			2	30	0.6	9.1	yellow clay	Clay	--	--	--	
220	7/9-36H1			30	70	9.1	21.3	blue clay	Clay	--	--	--	
220	7/9-36H1			70	102	21.3	31.1	gravel	Gravel	--	--	--	
220	7/9-36H1			102	280	31.1	85.3	blue clay	Clay	--	--	--	
220	7/9-36H1			280	350	85.3	106.7	hard sandstone	Sandstone	hard	--	--	QTm
220	7/9-36H1			350	485	106.7	147.8	sandstone	Sandstone	cemented	--	--	
220	7/9-36H1			485	503	147.8	153.3	blue sand	Sand	--	--	--	
220	7/9-36H1			503	510	153.3	155.4	sandstone	Sandstone	cemented	--	--	
220	7/9-36H1			510	560	155.4	170.7	gravel and sand; fair	Sand (or sandstone) and gravel	--	--	--	
220	7/9-36H1			560	568	170.7	173.1	blue clay	Clay	--	--	--	
221	7/6-32F1	221	7/6-32F1	0	21	0.0	6.4	tule mud	Clay and sand (or sandstone)	--	--	tule	Qyal and QTge
221	7/6-32F1			21	29	6.4	8.8	rock and gravel	Sand (or sandstone) and gravel	--	--	--	
221	7/6-32F1			29	45	8.8	13.7	clay, yellow, gravel, water	Clay and gravel	--	--	--	
221	7/6-32F1			45	70	13.7	21.3	gravel, cement	Gravel	cemented	--	--	
221	7/6-32F1			70	80	21.3	24.4	shale, blue, clay	Clay and sand (or sandstone)	cemented	--	--	
221	7/6-32F1			80	99	24.4	30.2	clay, blue	Clay	--	--	--	
221	7/6-32F1			99	103	30.2	31.4	gravel, some water	Gravel	--	--	--	
221	7/6-32F1			103	120	31.4	36.6	clay, blue	Clay	--	--	--	
221	7/6-32F1			120	137	36.6	41.8	shale rock	Clay and sand (or sandstone)	cemented	--	--	
221	7/6-32F1			137	160	41.8	48.8	clay, yellow, gravel, and rock	Clay and gravel	--	--	--	
221	7/6-32F1			160	175	48.8	53.3	clay, rock, and gravel	Clay and gravel	--	--	--	
221	7/6-32F1			175	190	53.3	57.9	gravel, cement	Gravel	cemented	--	--	
222	7/9-34L1	222	7/9-34L1	0	300	0.0	91.4	no data	No data	--	--	--	--
222	7/9-34L1			300	315	91.4	96.0	sand	Sand	--	--	--	QTm
223	7/9-36F1	223	7/9-36F1	0	30	0.0	9.1	gumbo	Clay and sand (or sandstone)	--	--	--	QTge
223	7/9-36F1			30	40	9.1	12.2	clay and mixed gravel	Clay and gravel	--	--	--	
223	7/9-36F1			40	45	12.2	13.7	gravel, pea; some water	Gravel	--	--	--	
223	7/9-36F1			45	60	13.7	18.3	clay	Clay	--	--	--	
223	7/9-36F1			60	70	18.3	21.3	gravel, fine	Gravel	--	--	--	
223	7/9-36F1			70	90	21.3	27.4	gravel large water	Gravel	--	--	--	
223	7/9-36F1			90	122	27.4	37.2	shale and small boulders	Clay, sand, and gravel	cemented	--	--	
223	7/9-36F1			122	133	37.2	40.5	pack sand, solid	Sand	--	--	--	
223	7/9-36F1			133	155	40.5	47.2	dirt, black	Sand and clay	--	--	--	
223	7/9-36F1			155	160	47.2	48.8	mud	Sand and clay	--	--	--	
223	7/9-36F1			160	188	48.8	57.3	sand, river; water	Sand	--	--	--	QTm
223	7/9-36F1			188	200	57.3	61.0	clay and mixed sand	Clay and gravel	--	--	--	
223	7/9-36F1			200	228	61.0	69.5	sand, quick; water	Sand	--	--	--	
223	7/9-36F1			228	251	69.5	76.5	gravel, fine; water	Gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
223	7/9-36F1			251	270	76.5	82.3	gravel, coarse; water	Gravel	--	--	--	--
224	7/9-31J1	224	7/9-31J1	0	40	0.0	12.2	no data	No data	--	--	--	--
224	7/9-31J1			40	62	12.2	18.9	fine sand	Sand	--	--	--	QTm
224	7/9-31J1			62	185	18.9	56.4	no data	No data	--	--	--	
224	7/9-31J1			185	241	56.4	73.5	sandstone with clam shells	Sandstone	cemented	shells	--	
224	7/9-31J1			241	296	73.5	90.2	no data	No data	--	--	--	
								sandstone containing streak					
224	7/9-31J1			296	352	90.2	107.3	gravel	Sand (or sandstone) and gravel	cemented	--	--	
225	7/9-34J1	225	7/9-34J1	0	230	0.0	70.1	(cased to 204 ft)	No data	--	--	--	QTm
226	7/7-32G1	226	7/7-32G1	0	40	0.0	12.2	gravel	Gravel	--	--	--	Qyal
226	7/7-32G1			40	110	12.2	33.5	clay and volcanic ash	Ash or tuff	--	--	--	QTge
226	7/7-32G1			110	130	33.5	39.6	clay and volcanic ash	Ash or tuff	--	--	--	
226	7/7-32G1			130	210	39.6	64.0	basalt	Basalt	--	--	--	Tsv
226	7/7-32G1			210	260	64.0	79.2	ash, white, volcanic	Ash or tuff	--	--	--	
226	7/7-32G1			260	270	79.2	82.3	basalt and white volcanic ash	Basalt	--	--	--	
226	7/7-32G1			270	330	82.3	100.6	white volcanic ash	Ash or tuff	--	--	--	
								white volcanic ash and basalt cuttings (probably basalt boulders					
226	7/7-32G1			330	340	100.6	103.6	in basaltic tuff)	Ash or tuff	--	--	--	
226	7/7-32G1			340	370	103.6	112.8	dark gray volcanic ash	Ash or tuff	--	--	--	
								gray volcanic ash, and dark gray clay (also woody material reported by driller as redwood log)					
226	7/7-32G1			370	390	112.8	118.9	Ash or tuff	--	--	wood		
226	7/7-32G1			390	402	118.9	122.5	white volcanic ash	Ash or tuff	--	--	--	
226	7/7-32G1			402	403	122.5	122.8	basalt	Basalt	--	--	--	
227	7/9-34J2	227	7/9-34J2	0	310	0.0	94.5	no data	No data	--	--	--	--
227	7/9-34J2			310	330	94.5	100.6	(perforated Intervals)	No data	--	--	--	QTm
227	7/9-34J2			330	350	100.6	106.7	no data	No data	--	--	--	
228	7/8-33M1	228	7/8-33M1	0	40	0.0	12.2	clay	Clay	--	--	--	QTge
228	7/8-33M1			40	63	12.2	19.2	gravel	Gravel	--	--	--	
228	7/8-33M1			63	87	19.2	26.5	clay	Clay	--	--	--	
228	7/8-33M1			87	104	26.5	31.7	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
228	7/8-33M1			104	146	31.7	44.5	clay	Clay	--	--	--	
228	7/8-33M1			146	153	44.5	46.6	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
228	7/8-33M1			153	172	46.6	52.4	clay	Clay	--	--	--	
228	7/8-33M1			172	301	52.4	91.7	gravel	Gravel	--	--	--	
228	7/8-33M1			301	346	91.7	105.5	blue clay	Clay	--	--	--	
228	7/8-33M1			346	375	105.5	114.3	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
228	7/8-33M1			375	422	114.3	128.6	blue clay	Clay	--	--	--	
228	7/8-33M1			422	452	128.6	137.8	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
229	7/9-31Q1	229	7/9-31Q1	0	90	0.0	27.4	no data	No data	--	--	--	--
229	7/9-31Q1			90	235	27.4	71.6	sandstone	Sandstone	cemented	--	--	QTm
230	7/9-36M1	230	7/9-36M1	0	4	0.0	1.2	adobe	Sand and clay	--	--	--	QTge
230	7/9-36M1			4	8	1.2	2.4	sandstone, yellow	Sandstone	cemented	--	--	
230	7/9-36M1			8	38	2.4	11.6	clay, blue	Clay	--	--	--	
230	7/9-36M1			38	46	11.6	14.0	sandstone and gravel	Sand (or sandstone) and gravel	cemented	--	--	
230	7/9-36M1			46	72	14.0	21.9	clay, blue	Clay	--	--	--	
								sand, blue, and some gravel;					
230	7/9-36M1			72	86	21.9	26.2	water	Sand (or sandstone) and gravel	--	--	--	
230	7/9-36M1			86	88	26.2	26.8	sandstone, blue	Sandstone	cemented	--	--	QTm
231	7/9-31Q3	231	7/9-31Q3	0	250	0.0	76.2	(Uncased below 8 ft.)	No data	--	--	--	QTm
232	7/9-35R1	232	7/9-35R1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	QTm
232	7/9-35R1			4	28	1.2	8.5	sand blue and gravel	Sand (or sandstone) and gravel	--	--	--	
232	7/9-35R1			28	37	8.5	11.3	sand, gray, and gravel	Sand (or sandstone) and gravel	--	--	--	
232	7/9-35R1			37	42	11.3	12.8	sand, yellow, dry, and clay	Sand	--	--	--	
232	7/9-35R1			42	52	12.8	15.8	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
232	7/9-35R1			52	55	15.8	16.8	sand, red, and gravel	Sand	--	--	--	
232	7/9-35R1			55	61	16.8	18.6	gravel and some sand	Sand (or sandstone) and gravel	--	--	--	
232	7/9-35R1			61	63	18.6	19.2	gravel	Gravel	--	--	--	
232	7/9-35R1			63	70	19.2	21.3	sand, clay, and gravel	Clay, sand, and gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
232	7/9-35R1			70	90	21.3	27.4	clay, hard, and white sand	Clay and sand (or sandstone)	hard	--	--	
233	6/9-3A1	233	6/9-3A1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	QTm
233	6/9-3A1			4	30	1.2	9.1	sand, dry	Sand	--	--	--	
233	6/9-3A1			30	155	9.1	47.2	sand, yellow	Sand	--	--	--	
233	6/9-3A1			155	250	47.2	76.2	clay, blue, and sand	Clay and sand (or sandstone)	--	--	--	
233	6/9-3A1			250	260	76.2	79.2	sandstone, blue	Sandstone	cemented	--	--	
234	6/9-2C1	234	6/9-2C1	0	45	0.0	13.7	topsoil, red	Sand and clay	--	--	--	QTm
234	6/9-2C1			45	48	13.7	14.6	sandstone	Sandstone	cemented	--	--	
234	6/9-2C1			48	52	14.6	15.8	sand	Sand	--	--	--	
234	6/9-2C1			52	53	15.8	16.2	sandstone	Sandstone	cemented	--	--	
234	6/9-2C1			53	59	16.2	18.0	sand	Sand	--	--	--	
234	6/9-2C1			59	61	18.0	18.6	sandstone	Sandstone	cemented	--	--	
234	6/9-2C1			61	64	18.6	19.5	sand	Sand	--	--	--	
234	6/9-2C1			64	66	19.5	20.1	sandstone	Sandstone	cemented	--	--	
234	6/9-2C1			66	70	20.1	21.3	sand	Sand	--	--	--	
234	6/9-2C1			70	71	21.3	21.6	sandstone	Sandstone	cemented	--	--	
234	6/9-2C1			71	76	21.6	23.2	sand	Sand	--	--	--	
234	6/9-2C1			76	77	23.2	23.5	sandstone	Sandstone	cemented	--	--	
234	6/9-2C1			77	80	23.5	24.4	sand, yellow	Sand	--	--	--	
234	6/9-2C1			80	82	24.4	25.0	sandstone	Sandstone	cemented	--	--	
234	6/9-2C1			82	86	25.0	26.2	sand	Sand	--	--	--	
234	6/9-2C1			86	87	26.2	26.5	sandstone	Sandstone	cemented	--	--	
234	6/9-2C1			87	110	26.5	33.5	sand	Sand	--	--	--	
234	6/9-2C1			110	112	33.5	34.1	sandstone	Sandstone	cemented	--	--	
234	6/9-2C1			112	172	34.1	52.4	sand, yellow	Sand	--	--	--	
234	6/9-2C1			172	175	52.4	53.3	rock, lime	Sandstone	hard	--	--	
234	6/9-2C1			175	204	53.3	62.2	shells and sand, blue	Sand	--	shells	--	
234	6/9-2C1			204	210	62.2	64.0	shells, petrified	Sandstone	cemented	shells	--	
234	6/9-2C1			210	216	64.0	65.8	sand, blue	Sand	--	--	--	
234	6/9-2C1			216	218	65.8	66.4	sand, rock	Sandstone	cemented	--	--	
234	6/9-2C1			218	222	66.4	67.7	sand, blue	Sand	--	--	--	
234	6/9-2C1			222	230	67.7	70.1	sand, rock, blue	Sandstone	cemented	--	--	
234	6/9-2C1			230	235	70.1	71.6	sand, blue and shells	Sand	--	shells	--	
234	6/9-2C1			235	236	71.6	71.9	sand rock, blue	Sandstone	cemented	--	--	
234	6/9-2C1			236	243	71.9	74.1	sand, blue	Sand	--	--	--	
234	6/9-2C1			243	244	74.1	74.4	sand rock, blue	Sandstone	cemented	--	--	
234	6/9-2C1			244	255	74.4	77.7	sand, blue	Sand	--	--	--	
234	6/9-2C1			255	258	77.7	78.6	sand rock, blue	Sandstone	cemented	--	--	
234	6/9-2C1			258	268	78.6	81.7	sand, blue and shells	Sand	--	shells	--	
234	6/9-2C1			268	273	81.7	83.2	sand rock, gray	Sandstone	cemented	--	--	
234	6/9-2C1			273	302	83.2	92.0	sand rock, blue, and shells	Sandstone	cemented	shells	--	
234	6/9-2C1			302	304	92.0	92.7	clam shells, fair	Sand	--	shells	--	
234	6/9-2C1			304	322	92.7	98.1	sand, blue	Sand	--	--	--	
234	6/9-2C1			322	323	98.1	98.5	clam shells, fair	Sand	--	shells	--	
234	6/9-2C1			323	332	98.5	101.2	clay and sand, blue	Clay and sand (or sandstone)	--	--	--	
234	6/9-2C1			332	335	101.2	102.1	clam shells, good	Sand	--	shells	--	
234	6/9-2C1			335	337	102.1	102.7	shells, petrified	Sandstone	cemented	shells	--	
234	6/9-2C1			337	342	102.7	104.2	clam shells and sand	Sand	--	shells	--	
234	6/9-2C1			342	345	104.2	105.2	sand rock	Sandstone	cemented	--	--	
234	6/9-2C1			345	350	105.2	106.7	clam shells, good	Sand	--	shells	--	
234	6/9-2C1			350	361	106.7	110.0	sand, blue	Sand	--	--	--	
234	6/9-2C1			361	362	110.0	110.3	sand rock	Sandstone	cemented	--	--	
234	6/9-2C1			362	364	110.3	110.9	clam shells and rock	Sandstone	--	shells	--	
234	6/9-2C1			364	374	110.9	114.0	sand, blue	Sand	--	--	--	
234	6/9-2C1			374	378	114.0	115.2	rock and shells	Sandstone	--	shells	--	
234	6/9-2C1			378	399	115.2	121.6	sand, blue	Sand	--	--	--	
234	6/9-2C1			399	429	121.6	130.8	clay, blue	Clay	--	--	--	
234	6/9-2C1			429	444	130.8	135.3	sand, blue	Sand	--	--	--	
234	6/9-2C1			444	480	135.3	146.3	sediments, blue	Sand	--	--	--	
234	6/9-2C1			480	487	146.3	148.4	sand, shells, and rock	Sand (or sandstone) and gravel	--	shells	--	
234	6/9-2C1			487	499	148.4	152.1	shells and sand	Sand	--	shells	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
234	6/9-2C1			499	505	152.1	153.9	sand rock	Sandstone	cemented	--	--	
234	6/9-2C1				505	512	153.9	156.1	sand, blue	Sand	--	--	
234	6/9-2C1				512	514	156.1	156.7	sand, grit, and shells	Sand	--	--	
234	6/9-2C1				514	530	156.7	161.5	sand, blue	Sand	--	--	
234	6/9-2C1				530	533	161.5	162.5	rock, sand, and shells	Sand (or sandstone) and gravel	hard	shells	
234	6/9-2C1				533	539	162.5	164.3	shells, sand, and grit	Sand	--	shells	
234	6/9-2C1				539	590	164.3	179.8	sediment, blue, and blue sand	Sand	--	--	
234	6/9-2C1				590	600	179.8	182.9	clam shells and sand	Sand	--	shells	
235	6/8-5E1	235	6/8-5E1	0	10	0.0	3.0	coarse, brown sand	Sand	--	--	--	QTge
235	6/8-5E1				10	20	3.0	6.1	brown sand and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				20	30	6.1	9.1	gray silt and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				30	40	9.1	12.2	gray sandy silt	Sand and clay	--	--	
235	6/8-5E1				40	50	12.2	15.2	gray silt and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				50	60	15.2	18.3	coarse dark-green sand	Sand	--	--	
235	6/8-5E1				60	70	18.3	21.3	silt and fine gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				70	90	21.3	27.4	silt and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				90	100	27.4	30.5	sandy silt and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				100	120	30.5	36.6	blue clay	Clay	--	--	
235	6/8-5E1				120	140	36.6	42.7	blue clay and gravel	Clay and gravel	--	--	
235	6/8-5E1				140	150	42.7	45.7	blue clay	Clay	--	--	
235	6/8-5E1				150	160	45.7	48.8	blue clay and coarse gravel	Clay and gravel	--	--	
235	6/8-5E1				160	170	48.8	51.8	gravel, medium	Gravel	--	--	
235	6/8-5E1				170	220	51.8	67.1	gravel	Gravel	--	--	
235	6/8-5E1				220	250	67.1	76.2	sand and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				250	260	76.2	79.2	gray sand	Sand	--	--	QTm
235	6/8-5E1				260	280	79.2	85.3	clay and gravel	Clay and gravel	--	--	
235	6/8-5E1				280	300	85.3	91.4	gray sandy silt	Sand and clay	--	--	
235	6/8-5E1				300	310	91.4	94.5	blue clay	Clay	--	--	
235	6/8-5E1				310	330	94.5	100.6	sandy silt and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				330	340	100.6	103.6	gravel	Gravel	--	--	
235	6/8-5E1				340	350	103.6	106.7	blue sand and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				350	370	106.7	112.8	gray sand	Sand	--	--	
235	6/8-5E1				370	380	112.8	115.8	sandy silt and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				380	390	115.8	118.9	sand	Sand	--	--	
235	6/8-5E1				390	400	118.9	121.9	sand and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				400	410	121.9	125.0	blue clay	Clay	--	--	
235	6/8-5E1				410	430	125.0	131.1	sandy silt and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				430	440	131.1	134.1	sand and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				440	460	134.1	140.2	blue sand	Sand	--	--	
235	6/8-5E1				460	480	140.2	146.3	blue clay	Clay	--	--	
235	6/8-5E1				480	490	146.3	149.4	sand silt	Sand and clay	--	--	
235	6/8-5E1				490	510	149.4	155.4	sand	Sand	--	--	
235	6/8-5E1				510	530	155.4	161.5	sand and gravel	Sand (or sandstone) and gravel	--	--	
235	6/8-5E1				530	638	161.5	194.5	sand, medium coarse	Sand	--	--	
								volcanic conglomerate formation (probably includes thin interval of terrace or fan deposits)					
236	6/6-4J1	236	6/6-4J1	0	80	0.0	24.4		Ash or tuff	--	--	--	Tsv
236	6/6-4J1				80	153	24.4	46.6	rock, black volcanic	Ash or tuff	hard	--	
236	6/6-4J1				153	190	46.6	57.9	rock, red and black volcanic	Ash or tuff	hard	--	
237	6/7-3Q1	237	6/7-3Q1	0	27	0.0	8.2	clay	Clay	--	--	--	QTge
237	6/7-3Q1				27	48	8.2	14.6	gravel	Gravel	--	--	
237	6/7-3Q1				48	50	14.6	15.2	gravel, brown, washed	Gravel	--	--	
237	6/7-3Q1				50	98	15.2	29.9	clay	Clay	--	--	
237	6/7-3Q1				98	110	29.9	33.5	gravel, wash	Gravel	--	--	
237	6/7-3Q1				110	125	33.5	38.1	basalt	Basalt	--	--	Tsv
237	6/7-3Q1				125	417	38.1	127.1	ash, white	Ash or tuff	--	--	
238	6/8-7D1	238	6/8-7D1	0	4	0.0	1.2	topsoil	Sand and clay	--	--	--	Qyal and QTge (?)
								sand, blue, and gravel; good					
238	6/8-7D1				0	271	0.0	82.6	looking gravel	Clay and sand (or sandstone)	--	--	
238	6/8-7D1				4	17	1.2	5.2	clay sandy yellow	Clay and sand (or sandstone)	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
238	6/8-7D1			17	24	5.2	7.3	sand, yellow, and gravel	Sand (or sandstone) and gravel	--	--	--	
238	6/8-7D1			24	35	7.3	10.7	clay, blue	Clay	--	--	--	
238	6/8-7D1			35	42	10.7	12.8	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
238	6/8-7D1			42	130	12.8	39.6	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
238	6/8-7D1			130	135	39.6	41.1	clay, yellow	Clay	--	--	--	
238	6/8-7D1			135	138	41.1	42.1	sand, yellow, and some gravel	Sand (or sandstone) and gravel	--	--	--	
238	6/8-7D1			138	140	42.1	42.7	sand, yellow, and little gravel	Sand (or sandstone) and gravel	--	--	--	
238	6/8-7D1			140	225	42.7	68.6	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
238	6/8-7D1			225	236	68.6	71.9	sand, yellow, fairly coarse	Sand	--	--	--	
238	6/8-7D1			236	276	71.9	84.1	sand, yellow	Sand (or sandstone) and gravel	--	--	--	
238	6/8-7D1			271	410	82.6	125.0	sand, blue, and gravel	Clay and gravel	--	--	--	
238	6/8-7D1			276	315	84.1	96.0	clay, blue, and streaks of black	Clay	--	--	--	
238	6/8-7D1			315	325	96.0	99.1	sandstone, yellow, soft	Sand (or sandstone) and gravel	cemented	--	--	
238	6/8-7D1			325	332	99.1	101.2	clay, sandy, blue	Clay and gravel	--	--	--	
								clay, blue, and streaks of black					
238	6/8-7D1			332	360	101.2	109.7	gravel	Clay and gravel	--	--	--	
239	6/8-12J1	239	6/8-12J1	0	7	0.0	2.1	soil, black	Sand and clay	--	--	--	
239	6/8-12J1		6/8-12J1	7	27	2.1	8.2	sandy, yellow clay	Clay and sand (or sandstone)	--	--	--	
239	6/8-12J1		6/8-12J1	27	28	8.2	8.5	yellow clay and gravel	Clay and gravel	--	--	--	
239	6/8-12J1		6/8-12J1	28	39	8.5	11.9	yellow clay and gravel	Clay and gravel	--	--	--	
239	6/8-12J1		6/8-12J1	39	50	11.9	15.2	blue clay	Clay	--	--	--	
239	6/8-12J1		6/8-12J1	50	72	15.2	21.9	yellow clay	Clay	--	--	--	
239	6/8-12J1		6/8-12J1	72	76	21.9	23.2	yellow clay and gravel	Clay and gravel	--	--	--	
239	6/8-12J1		6/8-12J1	76	110	23.2	33.5	yellow clay	Clay	--	--	--	
239	6/8-12J1		6/8-12J1	110	135	33.5	41.1	yellow clay and gravel	Clay and gravel	--	--	--	
239	6/8-12J1		6/8-12J1	135	205	41.1	62.5	yellow clay	Clay	--	--	--	
239	6/8-12J1		6/8-12J1	205	223	62.5	68.0	sandy yellow clay and gravel	Clay, sand, and gravel	--	--	--	
240	6/6-8N1	240	6/6-8N1	0	16	0.0	4.9	surface	Sand and clay	--	--	--	
240	6/6-8N1		6/6-8N1	16	20	4.9	6.1	gravel	Gravel	--	--	--	
240	6/6-8N1		6/6-8N1	20	65	6.1	19.8	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
240	6/6-8N1		6/6-8N1	65	85	19.8	25.9	gravel and boulders	Gravel	--	--	--	
240	6/6-8N1		6/6-8N1	85	100	25.9	30.5	boulders	Gravel	--	--	--	
240	6/6-8N1		6/6-8N1	100	195	30.5	59.4	clay, yellow	Clay	--	--	--	
240	6/6-8N1		6/6-8N1	195	205	59.4	62.5	boulders and gravel	Gravel	--	--	--	
240	6/6-8N1							volcanic rock, soft (probably tuffaceous Glen Ellen)	Ash or tuff	--	--	--	
240	6/6-8N1			205	445	62.5	135.6	lava rock, blue	Basalt	hard	--	--	
240	6/6-8N1			445	490	135.6	149.4	dirt and boulders	Sand (or sandstone) and gravel	--	--	--	
241	6/6-17A1	241	6/6-17A1	0	33	0.0	10.1	clay, yellow, and boulders	Clay and gravel	--	--	--	
241	6/6-17A1		6/6-17A1	33	98	10.1	29.9	clay and gravel	Clay and gravel	--	--	--	
241	6/6-17A1		6/6-17A1	98	128	29.9	39.0	gravel	Gravel	--	--	--	
241	6/6-17A1		6/6-17A1	128	130	39.0	39.6	clay and gravel	Clay and gravel	--	--	--	
241	6/6-17A1		6/6-17A1	130	150	39.6	45.7	clay and gravel	Clay and gravel	--	--	--	
242	6/8-17K1	242	6/8-17K1	0	10	0.0	3.0	clay, yellow and gravel	Clay and gravel	--	--	--	
242	6/8-17K1		6/8-17K1	10	45	3.0	13.7	clay, sandy, yellow, and gravel	Clay, sand, and gravel	--	--	--	
242	6/8-17K1		6/8-17K1	45	50	13.7	15.2	sand, yellow, and gravel	Sand (or sandstone) and gravel	--	--	--	
242	6/8-17K1		6/8-17K1	50	55	15.2	16.8	sand, blue; some gravel	Sand (or sandstone) and gravel	--	--	--	
242	6/8-17K1		6/8-17K1	55	129	16.8	39.3	sand, blue, and gravel	Sand (or sandstone) and gravel	--	--	--	
242	6/8-17K1		6/8-17K1	129	134	39.3	40.8	clay, sandy, blue, and gravel	Clay, sand, and gravel	--	--	--	
242	6/8-17K1		6/8-17K1	134	136	40.8	41.5	sand, blue, and gravel	Sand (or sandstone) and gravel	--	--	--	
242	6/8-17K1		6/8-17K1	136	145	41.5	44.2	clay, blue, and gravel	Clay and gravel	--	--	--	
242	6/8-17K1		6/8-17K1	145	156	44.2	47.5	sand, blue, and gravel	Sand (or sandstone) and gravel	--	--	--	
242	6/8-17K1		6/8-17K1	156	162	47.5	49.4	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
242	6/8-17K1		6/8-17K1	162	210	49.4	64.0	sand, blue, and gravel	Sand (or sandstone) and gravel	--	--	--	
243	6/8-16R1	243	6/8-16R1A	0	15	0.0	4.6	sandy, yellow clay	Clay and sand (or sandstone)	--	--	--	
243	6/8-16R1		6/8-16R1B	15	40	4.6	12.2	blue clay	Clay	--	--	--	
243	6/8-16R1		6/8-16R1	40	72	12.2	21.9	yellow clay	Clay	--	--	--	
243	6/8-16R1		6/8-16R1	72	84	21.9	25.6	blue clay	Clay	--	--	--	
243	6/8-16R1		6/8-16R1	84	100	25.6	30.5	blue clay and gravel	Clay and gravel	--	--	--	
243	6/8-16R1		6/8-16R1	100	101	30.5	30.8	sandy yellow clay	Clay and sand (or sandstone)	--	--	--	
243	6/8-16R1		6/8-16R1	101	123	30.8	37.5	clay and gravel	Clay and gravel	--	--	--	
243	6/8-16R1		6/8-16R1	123	385	37.5	117.3	sandy yellow clay	Clay and sand (or sandstone)	--	--	--	QTm (?)

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
243	6/8-16R1			385	400	117.3	121.9	blue clay	Clay	--	--	--	
243	6/8-16R1			400	420	121.9	128.0	sandy blue clay	Clay and sand (or sandstone)	--	--	--	
243	6/8-16R1			420	512	128.0	156.1	blue clay	Clay	--	--	--	
243	6/8-16R1			512	526	156.1	160.3	blue sand	Sand	--	--	--	
243	6/8-16R1			526	794	160.3	242.0	blue clay	Clay	--	--	--	
243	6/8-16R1			794	805	242.0	245.4	gravel and sand	Sand (or sandstone) and gravel	--	--	--	
243	6/8-16R1			805	915	245.4	278.9	blue clay and some gravel	Clay and gravel	--	--	--	
243	6/8-16R1			915	930	278.9	283.5	blue clay	Clay	--	--	--	
243	6/8-16R1			930	937	283.5	285.6	gravel and sand	Sand (or sandstone) and gravel	--	--	--	
243	6/8-16R1							blue clay and streaks of yellow					
243	6/8-16R1			937	1050	285.6	320.0	clay	Clay and gravel	--	--	--	
243	6/8-16R1			1050	1065	320.0	324.6	sandy blue cement gravel	Sand (or sandstone) and gravel	cemented	--	--	
243	6/8-16R1			1065	1085	324.6	330.7	blue clay	Clay	--	--	--	
243	6/8-16R1			1085	1115	330.7	339.9	blue clay and gravel	Clay and gravel	--	--	--	
243	6/8-16R1			1115	1150	339.9	350.5	rock	Ash or tuff	hard	--	--	
243	6/8-16R1			1150	1198	350.5	365.2	blue clay and gravel	Clay and gravel	--	--	--	
243	6/8-16R1			1198	1204	365.2	367.0	boulders	Gravel	--	--	--	
244	6/9-22A1	244	6/9-22A1	0	8	0.0	2.4	topsoil, sandy loam	Sand and clay	--	--	--	QTm
244	6/9-22A1			8	20	2.4	6.1	clay, hard sandy yellow	Clay	hard	--	--	
244	6/9-22A1			20	94	6.1	28.7	blue sandstone, medium hard	Sandstone	hard	--	--	
244	6/9-22A1			94	112	28.7	34.1	blue sandstone, with shells	Sandstone	cemented	shells	--	
244	6/9-22A1			112	158	34.1	48.2	blue sandstone, medium hard	Sandstone	hard	--	--	
244	6/9-22A1			158	180	48.2	54.9	blue sandstone with shells	Sandstone	cemented	shells	--	
244	6/9-22A1			180	226	54.9	68.9	blue sandstone, medium hard	Sandstone	hard	--	--	
244	6/9-22A1			226	228	68.9	69.5	hard gray rock	Sandstone	hard	--	--	
244	6/9-22A1			228	247	69.5	75.3	hard gray sandstone	Sandstone	hard	--	--	
244	6/9-22A1			247	288	75.3	87.8	blue sandstone, medium hard	Sandstone	hard	--	--	
244	6/9-22A1			288	360	87.8	109.7	blue sandstone with shells	Sandstone	cemented	shells	--	
245	6/7-19D1	245	6/7-19D1	0	8	0.0	2.4	topsoil	Sand and clay	--	--	--	Qyal and QTge
245	6/7-19D1			8	21	2.4	6.4	clay, blue	Clay	--	--	--	
245	6/7-19D1			21	100	6.4	30.5	clay, sandy, brown, gravelly	Clay, sand, and gravel	--	--	--	
245	6/7-19D1			100	104	30.5	31.7	clay and gravel	Clay and gravel	--	--	--	
245	6/7-19D1			104	108	31.7	32.9	clay, sandy, brown	Clay and sand (or sandstone)	--	--	--	
246	6/8-23C1	246	6/8-23C1	0	3	0.0	0.9	adobe	Sand and clay	--	--	--	Qyal and QTge (?)
246	6/8-23C1			0	108	0.0	32.9	clay, blue	Clay	--	--	--	
246	6/8-23C1			3	15	0.9	4.6	clay, yellow	Clay	--	--	--	
246	6/8-23C1							clay, yellow and gravel; some					
246	6/8-23C1			15	25	4.6	7.6	water	Clay and gravel	--	--	--	
246	6/8-23C1			25	60	7.6	18.3	clay, blue and yellow	Clay	--	--	--	
246	6/8-23C1			60	65	18.3	19.8	gravel	Gravel	--	--	--	
246	6/8-23C1			65	130	19.8	39.6	clay and gravel	Clay and gravel	--	--	--	
246	6/8-23C1			108	260	32.9	79.2	clay, yellow, sandy, and gravel	Clay and sand (or sandstone)	--	--	--	
246	6/8-23C1			130	172	39.6	52.4	clay, yellow, and gravelly sand	Clay, sand, and gravel	--	--	--	QTm
246	6/8-23C1			172	194	52.4	59.1	clay, sandy yellow	Clay, sand, and gravel	--	--	--	
246	6/8-23C1			260	265	79.2	80.8	very soft streak	Clay, sand, and gravel	--	--	--	
246	6/8-23C1			265	336	80.8	102.4	clay, yellow, sandy, and gravel	Sand	--	--	--	
246	6/8-23C1			336	342	102.4	104.2	sand, soft, wet	Clay and sand (or sandstone)	--	--	--	
246	6/8-23C1			342	350	104.2	106.7	clay, yellow, and sand	Clay and gravel	--	--	--	
246	6/8-23C1							clay, yellow and gravelly; sticky					
246	6/8-23C1			350	411	106.7	125.3	last 10 ft.	Clay	--	--	--	
246	6/8-23C1			411	430	125.3	131.1	clay, blue	Clay	--	--	--	
246	6/8-23C1			430	438	131.1	133.5	clay, yellow	Clay	--	--	--	
247	6/8-22N1	247	6/8-22N1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	QTm
247	6/8-22N1			3	15	0.9	4.6	clay, pink, sandy	Clay and sand (or sandstone)	--	--	--	
247	6/8-22N1			15	21	4.6	6.4	clay, sandy, white, and gravel	Clay, sand, and gravel	--	--	--	
247	6/8-22N1			21	28	6.4	8.5	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
247	6/8-22N1			28	70	8.5	21.3	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
247	6/8-22N1			70	95	21.3	29.0	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
247	6/8-22N1			95	147	29.0	44.8	clay, blue	Clay	--	--	--	
247	6/8-22N1			147	155	44.8	47.2	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
247	6/8-22N1			155	170	47.2	51.8	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
247	6/8-22N1			170	185	51.8	56.4	clay, yellow	Clay	--	--	--	
247	6/8-22N1				185	190	56.4	57.9	sand, and clay, red	Sand and clay	--	--	--
247	6/8-22N1				190	195	57.9	59.4	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--
247	6/8-22N1				195	200	59.4	61.0	gravel	Gravel	--	--	--
248	6/7-29P1	248	6/7-29P1	0	1	0.0	0.3	"Hill formation"	Clay and gravel	--	--	--	Tsv
248	6/7-29P1				1	78	0.3	23.8	rock	Ash or tuff	hard	--	--
248	6/7-29P1				78	104	23.8	31.7	clay, blue and gravel	Clay and gravel	--	--	--
248	6/7-29P1				104	127	31.7	38.7	blue clay	Clay	--	--	--
248	6/7-29P1				127	140	38.7	42.7	decayed rock	Ash or tuff	--	--	--
248	6/7-29P1				140	168	42.7	51.2	decayed rock, blue	Ash or tuff	--	--	--
248	6/7-29P1				168	185	51.2	56.4	no data	Ash or tuff	--	--	--
249	6/8-35A2	249	6/8-35A2	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qyal
249	6/8-35A2				3	28	0.9	8.5	clay, yellow	Clay	--	--	--
249	6/8-35A2				28	38	8.5	11.6	clay, blue	Clay	--	--	--
249	6/8-35A2				38	42	11.6	12.8	clay, blue, and gravel	Clay and gravel	--	--	--
249	6/8-35A2				42	80	12.8	24.4	clay, yellow	Clay	--	--	QTm
249	6/8-35A2				80	101	24.4	30.8	clay, sandy, yellow, and gravel	Clay, sand, and gravel	--	--	--
249	6/8-35A2				101	125	30.8	38.1	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--
249	6/8-35A2				125	137	38.1	41.8	clay, blue	Clay	--	--	--
249	6/8-35A2				137	157	41.8	47.9	clay, yellow	Clay	--	--	--
249	6/8-35A2				157	161	47.9	49.1	rock (probably cemented sand)	Sandstone	cemented	--	--
249	6/8-35A2				161	235	49.1	71.6	clay, yellow	Clay	--	--	--
249	6/8-35A2				235	238	71.6	72.5	clay, yellow, sandy	Clay and sand (or sandstone)	--	--	--
249	6/8-35A2				238	240	72.5	73.2	clay, yellow, sandy; little gravel	Clay, sand, and trace gravel	--	--	--
249	6/8-35A2				240	246	73.2	75.0	clay, blue	Clay	--	--	--
249	6/8-35A2				246	298	75.0	90.8	clay, yellow	Clay	--	--	--
249	6/8-35A2				298	368	90.8	112.2	clay, blue	Clay	--	--	--
249	6/8-35A2				368	369	112.2	112.5	redwood	No data	--	--	wood
249	6/8-35A2				369	400	112.5	121.9	clay, blue, and gravel	Clay and gravel	--	--	--
249	6/8-35A2				400	425	121.9	129.5	clay, blue	Clay	--	--	--
249	6/8-35A2				425	515	129.5	157.0	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--
249	6/8-35A2				515	528	157.0	160.9	sand, yellow	Sand	--	--	--
249	6/8-35A2				528	548	160.9	167.0	sand, yellow	Sand	--	--	--
249	6/8-35A2				548	554	167.0	168.9	clay, brown, and redwood	Clay	--	--	wood
249	6/8-35A2				554	564	168.9	171.9	clay, blue	Clay	--	--	--
249	6/8-35A2				564	567	171.9	172.8	clay blue, and gravel	Clay and gravel	--	--	--
249	6/8-35A2				567	585	172.8	178.3	clay and gravel	Clay and gravel	--	--	--
249	6/8-35A2				585	605	178.3	184.4	clay blue	Clay	--	--	--
249	6/8-35A2				605	615	184.4	187.5	clay and gravel	Clay and gravel	--	--	--
249	6/8-35A2				615	623	187.5	189.9	sand blue, and gravel	Sand (or sandstone) and gravel	--	--	--
249	6/8-35A2				623	635	189.9	193.5	clay, blue, tough	Clay	--	--	--
249	6/8-35A2				635	647	193.5	197.2	clay, blue tough; some gravel	Clay and gravel	--	--	--
249	6/8-35A2				647	650	197.2	198.1	clay, blue	Clay	--	--	--
249	6/8-35A2				650	660	198.1	201.2	shale	Clay and sand (or sandstone)	cemented	--	--
250	6/8-36A1	250	6/8-36A1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Qyal and QTm
250	6/8-36A1				4	7	1.2	2.1	clay, yellow	Clay	--	--	--
250	6/8-36A1				7	31	2.1	9.4	clay, yellow, and gravel; mixed	Clay and gravel	--	--	--
250	6/8-36A1				31	40	9.4	12.2	clay, yellow	Clay	--	--	--
250	6/8-36A1				40	42	12.2	12.8	clay yellow, and gravel	Clay and gravel	--	--	--
250	6/8-36A1				42	60	12.8	18.3	clay, yellow	Clay	--	--	--
250	6/8-36A1				60	64	18.3	19.5	clay, yellow, and gravel	Clay and gravel	--	--	--
250	6/8-36A1				64	80	19.5	24.4	clay sandy yellow	Clay and sand (or sandstone)	--	--	--
250	6/8-36A1				80	85	24.4	25.9	clay, sandy, yellow, and gravel	Clay, sand, and gravel	--	--	--
250	6/8-36A1				85	108	25.9	32.9	clay, yellow	Clay	--	--	--
250	6/8-36A1				108	128	32.9	39.0	sand, yellow	Sand	--	--	--
250	6/8-36A1				128	130	39.0	39.6	clay, yellow	Clay	--	--	--
250	6/8-36A1				130	136	39.6	41.5	clay, sandy, yellow, and gravel	Clay, sand, and gravel	--	--	--
250	6/8-36A1				136	150	41.5	45.7	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--
250	6/8-36A1				150	158	45.7	48.2	sand, yellow, and sandy gravel	Sand (or sandstone) and gravel	--	--	--
250	6/8-36A1				158	178	48.2	54.3	clay, yellow	Clay	--	--	--

**Appendix 3.** Lithologic data.—Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
250	6/8-36A1			178	185	54.3	56.4	clay, yellow, and little fine gravel	Clay and gravel	--	--	--	
250	6/8-36A1			185	240	56.4	73.2	clay yellow	Clay	--	--	--	
250	6/8-36A1			240	264	73.2	80.5	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
250	6/8-36A1			264	282	80.5	86.0	sandstone, yellow	Sandstone	cemented	--	--	
250	6/8-36A1			282	284	86.0	86.6	clay, yellow	Clay	--	--	--	
250	6/8-36A1			284	287	86.6	87.5	sand, fine, yellow	Sand	--	--	--	
250	6/8-36A1							clay, yellow, and gravel; small amount					
250	6/8-36A1			287	290	87.5	88.4	amount	Clay and gravel	--	--	--	
250	6/8-36A1			290	324	88.4	98.8	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
250	6/8-36A1			324	338	98.8	103.0	gravel, yellow, cemented	Gravel	cemented	--	--	
250	6/8-36A1			338	344	103.0	104.9	clay, yellow	Clay	--	--	--	
250	6/8-36A1			344	347	104.9	105.8	clay, blue	Clay	--	--	--	
250	6/8-36A1			347	350	105.8	106.7	clay, yellow	Clay	--	--	--	
250	6/8-36A1							clay, yellow, and small amount					
250	6/8-36A1			350	353	106.7	107.6	gravel	Clay, sand, and trace gravel	--	--	--	
250	6/8-36A1			353	360	107.6	109.7	clay, yellow	Clay	--	--	--	
250	6/8-36A1			360	376	109.7	114.6	clay blue	Clay	--	--	--	
250	6/8-36A1			376	391	114.6	119.2	gravel, blue, cemented	Gravel	cemented	--	--	
250	6/8-36A1			391	392	119.2	119.5	clay, blue	Clay	--	--	--	
250	6/8-36A1			392	402	119.5	122.5	gravel, blue, cemented	Gravel	cemented	--	--	
250	6/8-36A1			402	424	122.5	129.2	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
250	6/8-36A1			424	433	129.2	132.0	clay, yellow	Clay	--	--	--	
250	6/8-36A1			433	443	132.0	135.0	clay, yellow	Clay	--	--	--	
250	6/8-36A1							clay, sandy, blue; little gravel, 471-476 ft.					
250	6/8-36A1			443	476	135.0	145.1	Clay, sand, and trace gravel	--	--	--	--	
250	6/8-36A1			476	490	145.1	149.4	clay, sandy, green	Clay and sand (or sandstone)	--	--	--	
250	6/8-36A1			490	500	149.4	152.4	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
250	6/8-36A1			500	506	152.4	154.2	clay, blue	Clay	--	--	--	
250	6/8-36A1			506	512	154.2	156.1	gravel, cemented	Gravel	cemented	--	--	
250	6/8-36A1			512	522	156.1	159.1	clay, hard, blue	Clay	hard	--	--	
250	6/8-36A1			522	530	159.1	161.5	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
250	6/8-36A1			530	547	161.5	166.7	gravel, cemented	Gravel	cemented	--	--	
250	6/8-36A1			547	574	166.7	175.0	clay, blue	Clay	--	--	--	
250	6/8-36A1			574	603	175.0	183.8	gravel, cemented	Gravel	cemented	--	--	
250	6/8-36A1			603	622	183.8	189.6	clay, blue	Clay	--	--	--	
250	6/8-36A1												
250	6/8-36A1			622	638	189.6	194.5	clay, blue, gravel, and clam shells	Clay and gravel	--	shells	--	
250	6/8-36A1			638	695	194.5	211.8	clay, blue	Clay	--	--	--	Tp (?)
251	6/7-31H1	251	6/7-31H1	0	5	0.0	1.5	soil	Sand and clay	--	--	--	Qyal and QTge
251	6/7-31H1			5	12	1.5	3.7	clay yellow	Clay	--	--	--	
251	6/7-31H1			12	18	3.7	5.5	clay, yellow, and gravel	Clay and gravel	--	--	--	
251	6/7-31H1			18	29	5.5	8.8	clay yellow	Clay	--	--	--	
251	6/7-31H1			29	44	8.8	13.4	clay, yellow, and gravel	Clay and gravel	--	--	--	
251	6/7-31H1			44	80	13.4	24.4	clay, yellow	Clay	--	--	--	
251	6/7-31H1			80	115	24.4	35.1	clay, yellow, and gravel	Clay and gravel	--	--	--	
251	6/7-31H1			115	175	35.1	53.3	clay, yellow	Clay	--	--	--	
251	6/7-31H1			175	252	53.3	76.8	clay, yellow, and boulders	Clay and gravel	--	--	--	
251	6/7-31H1			252	255	76.8	77.7	clay, yellow	Clay	--	--	--	
251	6/7-31H1	252	6/7-31G1	255	298	77.7	90.8	clay, blue	Clay	--	--	--	
252	6/7-31G1			0	6	0.0	1.8	black soil	Sand and clay	--	--	--	Qyal and QTge
252	6/7-31G1			6	40	1.8	12.2	clay, yellow, and gravel	Clay and gravel	--	--	--	
252	6/7-31G1			40	272	12.2	82.9	clay, yellow	Clay	--	--	--	
252	6/7-31G1			272	289	82.9	88.1	volcanic rock	Ash or tuff	--	--	--	Tsv (?)
252	6/7-31G1			289	324	88.1	98.8	volcanic rock	Ash or tuff	--	--	--	
252	6/7-31G1			324	445	98.8	135.6	clay, blue	Clay	--	--	--	QTm (?)
252	6/7-31G1			445	446	135.6	135.9	sand	Sand	--	--	--	
252	6/7-31G1							hard shell (probably cemented)					
252	6/7-31G1			446	447	135.9	136.2	sand)	Sandstone	hard	shells	--	
252	6/7-31G1			447	468	136.2	142.6	sand	Sand	--	--	--	
252	6/7-31G1			468	470	142.6	143.3	hard	Sandstone	hard	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
252	6/7-31G1			470	480	143.3	146.3	(no record)	No data	--	--	--	
252	6/7-31G1			480	490	146.3	149.4	clay, blue	Clay	--	--	--	
252	6/7-31G1			490	508	149.4	154.8	shale, blue	Clay and sand (or sandstone)	cemented	--	--	Tp (?)
253	6/8-33E1	253 6/8-33E1	0	3	0.0	0.9	topsoil	Sand and clay	--	--	--		Tp
253	6/8-33E1		3	17	0.9	5.2	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--		
253	6/8-33E1		17	35	5.2	10.7	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--		
253	6/8-33E1		35	80	10.7	24.4	clay, blue	Clay	--	--	--		
253	6/8-33E1		80	90	24.4	27.4	gravel, first water	Gravel	--	--	--		
253	6/8-33E1		90	97	27.4	29.6	gravel cemented	Gravel	cemented	--	--		
253	6/8-33E1		97	117	29.6	35.7	gravel, cemented, blue	Gravel	cemented	--	--		
253	6/8-33E1		117	125	35.7	38.1	gravel, cemented	Gravel	cemented	--	--		
253	6/8-33E1		125	146	38.1	44.5	sand and clay, blue	Sand and clay	--	--	--		
253	6/8-33E1		146	153	44.5	46.6	gravel, free	Gravel	--	--	--		
253	6/8-33E1		153	165	46.6	50.3	gravel, cemented	Gravel	cemented	--	--		
253	6/8-33E1		165	175	50.3	53.3	sand and clay, blue	Sand and clay	--	--	--		
253	6/8-33E1		175	195	53.3	59.4	clay, blue and yellow, sticky	Clay	--	--	--		
253	6/8-33E1		195	215	59.4	65.5	clay and rock, jointed clay	Clay and gravel	--	--	--		
254	6/7-31L1	254 6/7-31L1	0	3	0.0	0.9	loam black	Sand and clay	--	--	--		
254	6/7-31L1		3	8	0.9	2.4	sand, gray	Sand	--	--	--		Qyal and QTge
254	6/7-31L1		8	18	2.4	5.5	clay, yellow, and gravel	Clay and gravel	--	--	--		
254	6/7-31L1		18	21	5.5	6.4	gravel	Gravel	--	--	--		
254	6/7-31L1		21	30	6.4	9.1	clay, yellow, sandy	Clay and sand (or sandstone)	--	--	--		
254	6/7-31L1		30	50	9.1	15.2	clay, yellow	Clay	--	--	--		
254	6/7-31L1		50	63	15.2	19.2	sand, yellow	Sand	--	--	--		
254	6/7-31L1		63	75	19.2	22.9	gravel	Gravel	--	--	--		
254	6/7-31L1		75	79	22.9	24.1	clay, yellow	Clay	--	--	--		
255	6/7-32M1	255 6/7-32M1	0	2	0.0	0.6	soil, black	Sand and clay	--	--	--		
255	6/7-32M1		2	3	0.6	0.9	sand blue, and gravel	Sand (or sandstone) and gravel	--	--	--		Qyal and QTge
255	6/7-32M1		3	5	0.9	1.5	soil, black	Sand and clay	--	--	--		
255	6/7-32M1		5	39	1.5	11.9	clay, yellow, and gravel	Clay and gravel	--	--	--		
255	6/7-32M1		39	40	11.9	12.2	gravel	Gravel	--	--	--		
255	6/7-32M1		40	70	12.2	21.3	boulders	Gravel	--	--	--		
255	6/7-32M1		70	75	21.3	22.9	clay and gravel	Clay and gravel	--	--	--		
255	6/7-32M1		75	95	22.9	29.0	clay, yellow, and gravel	Clay and gravel	--	--	--		
255	6/7-32M1		95	108	29.0	32.9	clay, blue	Clay	--	--	--		QTm
255	6/7-32M1		108	111	32.9	33.8	sand, yellow	Sand	--	--	--		
255	6/7-32M1		111	127	33.8	38.7	sand, blue, and yellow clay	Sand and clay	--	--	--		
255	6/7-32M1		127	131	38.7	39.9	sand, blue; streak of blue clay	Sand and clay	--	--	--		
255	6/7-32M1		131	209	39.9	63.7	clay, blue	Clay	--	--	--		
255	6/7-32M1		209	220	63.7	67.1	clay, blue, and gravel	Clay and gravel	--	--	--		
255	6/7-32M1		220	240	67.1	73.2	clay, blue	Clay	--	--	--		
255	6/7-32M1		240	260	73.2	79.2	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--		
255	6/7-32M1		260	290	79.2	88.4	clay, blue	Clay	--	--	--		
255	6/7-32M1		290	325	88.4	99.1	sandstone	Clay and sand (or sandstone)	cemented	--	--		
255	6/7-32M1		325	332	99.1	101.2	sandstone, blue, and fine gravel	Sandstone	cemented	--	--		
255	6/7-32M1		332	335	101.2	102.1	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--		
255	6/7-32M1		335	397	102.1	121.0	clay, blue	Clay	--	--	--		
255	6/7-32M1		397	408	121.0	124.4	clay, yellow	Clay	--	--	--		
255	6/7-32M1		408	425	124.4	129.5	clay, blue	Clay	--	--	--		
255	6/7-32M1		425	460	129.5	140.2	clay, yellow	Clay	--	--	--		
255	6/7-32M1		460	474	140.2	144.5	clay, blue	Clay	--	--	--		
255	6/7-32M1		474	475	144.5	144.8	clay, blue, and gravel	Clay and gravel	--	--	--		
255	6/7-32M1		475	497	144.8	151.5	clay, blue	Clay	--	--	--		
255	6/7-32M1		497	502	151.5	153.0	clay, yellow	Clay	--	--	--		
255	6/7-32M1		502	800	153.0	243.8	clay	Clay	--	--	--		
255	6/7-32M1		800	815	243.8	248.4	gravel, hard, cemented	Gravel	cemented	--	--		
255	6/7-32M1		815	850	248.4	259.1	soft	Clay	--	--	--		
255	6/7-32M1		850	920	259.1	280.4	clay and streaks of gravel	Clay and gravel	--	--	--		
255	6/7-32M1		920	963	280.4	293.5	clay	Clay	--	--	--		
255	6/7-32M1		963	980	293.5	298.7	rock	Ash or tuff	hard	--	--		Tsv

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
255	6/7-32M1			980	1008	298.7	307.2	clay and gravel	Clay and gravel	--	--	--	
255	6/7-32M1				1008	1010	307.2	307.8	rock	Ash or tuff	hard	--	--
255	6/7-32M1				1010	1138	307.8	346.9	clay and gravel	Clay and gravel	--	--	--
255	6/7-32M1				1138	1147	346.9	349.6	rock	Ash or tuff	hard	--	--
255	6/7-32M1				1147	1163	349.6	354.5	clay, hard	Clay	hard	--	--
256	6/7-31J1	256	6/7-31J1	0	6	0.0	1.8	adobe	Sand and clay	--	--	--	Tp
256	6/7-31J1			6	19	1.8	5.8	gray clay	Clay	--	--	--	Qyal and QTge
256	6/7-31J1			19	45	5.8	13.7	yellow clay	Clay	--	--	--	
256	6/7-31J1							sandy yellow clay and gravel; water at 80 ft.					
256	6/7-31J1			45	94	13.7	28.7		Clay, sand, and gravel	--	--	--	
256	6/7-31J1			94	103	28.7	31.4	yellow clay	Clay	--	--	--	
256	6/7-31J1			103	128	31.4	39.0	yellow clay and gravel	Clay and gravel	--	--	--	
256	6/7-31J1			128	140	39.0	42.7	yellow cemented gravel	Clay, sand, and gravel	cemented	--	--	
256	6/7-31J1			140	170	42.7	51.8	yellow clay	Clay	--	--	--	
256	6/7-31J1			170	183	51.8	55.8	yellow clay and gravel	Clay and gravel	--	--	--	
256	6/7-31J1			183	198	55.8	60.4	boulders	Gravel	--	--	--	
256	6/7-31J1			198	218	60.4	66.4	blue clay	Clay	--	--	--	QTm
256	6/7-31J1			218	220	66.4	67.1	blue sand and gravel	Sand (or sandstone) and gravel	--	--	--	
256	6/7-31J1			220	221	67.1	67.4	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
256	6/7-31J1			221	241	67.4	73.5	blue sand, packed	Sand	--	--	--	
256	6/7-31J1			241	251	73.5	76.5	blue sand	Sand	--	--	--	
256	6/7-31J1			251	274	76.5	83.5	blue sandstone	Sandstone	cemented	--	--	
256	6/7-31J1			274	280	83.5	85.3	blue clay	Clay	--	--	--	
257	5/7-6E1	257	5/7-6E1	0	3	0.0	0.9	loam, black	Sand and clay	--	--	--	Qyal and QTm
257	5/7-6E1			3	24	0.9	7.3	clay, yellow	Clay	--	--	--	
257	5/7-6E1			24	40	7.3	12.2	sand, yellow; and gravel; water	Sand	--	--	--	
257	5/7-6E1			40	45	12.2	13.7	clay blue	Clay	--	--	--	
257	5/7-6E1							sand and clay, gray; water at 85 ft.					
257	5/7-6E1			45	92	13.7	28.0	Sand and clay	--	--	--		
257	5/7-6E1			92	104	28.0	31.7	sand and gravel, gray	Sand (or sandstone) and gravel	--	--	--	
257	5/7-6E1			104	115	31.7	35.1	clay, blue	Clay	--	--	--	
258	5/8-1H1	258	5/8-1H1	0	2.5	0.0	0.8	soil	Sand and clay	--	--	--	Qyal and QTm
258	5/8-1H1			2.5	35	0.8	10.7	clay, yellow	Clay	--	--	--	
258	5/8-1H1			35	43	10.7	13.1	clay, blue	Clay	--	--	--	
258	5/8-1H1			43	50	13.1	15.2	clay, yellow	Clay	--	--	--	
258	5/8-1H1			50	62	15.2	18.9	clay, blue	Clay	--	--	--	
258	5/8-1H1			62	78	18.9	23.8	clay, yellow	Clay	--	--	--	
258	5/8-1H1			78	88	23.8	26.8	clay, blue	Clay	--	--	--	
258	5/8-1H1			88	98	26.8	29.9	clay, yellow	Clay	--	--	--	
258	5/8-1H1			98	110	29.9	33.5	clay, blue	Clay	--	--	--	
258	5/8-1H1			110	116	33.5	35.4	clay, yellow	Clay	--	--	--	
258	5/8-1H1			116	136	35.4	41.5	clay, blue	Clay	--	--	--	
258	5/8-1H1			136	140	41.5	42.7	clay, yellow	Clay	--	--	--	
258	5/8-1H1			140	151	42.7	46.0	clay, blue	Clay	--	--	--	
258	5/8-1H1			151	176	46.0	53.6	clay, blue and gravel	Clay and gravel	--	--	--	
258	5/8-1H1			176	186	53.6	56.7	clay blue	Clay	--	--	--	
258	5/8-1H1			186	190	56.7	57.9	clay, yellow	Clay	--	--	--	
258	5/8-1H1			190	219	57.9	66.8	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
258	5/8-1H1			219	224	66.8	68.3	clay, blue	Clay	--	--	--	
258	5/8-1H1			224	230	68.3	70.1	cemented sand and gravel, slightly	Sand (or sandstone) and gravel	cemented	--	--	
258	5/8-1H1			230	232	70.1	70.7	clay, blue	Clay	--	--	--	
258	5/8-1H1							clay, yellow, sandy; water at 70 feet					
259	5/7-5K1	259	5/7-5K1	0	74	0.0	22.6	Clay and sand (or sandstone)	--	--	--		QTm and Tp
259	5/7-5K1			74	131	22.6	39.9	clay, blue	Clay	--	--	--	
259	5/7-5K1			131	147	39.9	44.8	clay, brown	Clay	--	--	--	
259	5/7-5K1			147	204	44.8	62.2	clay, blue	Clay	--	--	--	
259	5/7-5K1			204	218	62.2	66.4	clay, yellow	Clay	--	--	--	
259	5/7-5K1			218	253	66.4	77.1	clay, blue	Clay	--	--	--	
259	5/7-5K1			253	265	77.1	80.8	clay, blue and gravel	Clay and gravel	--	--	--	
259	5/7-5K1			265	317	80.8	96.6	clay, blue	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
259	5/7-5K1			317	326	96.6	99.4	clay, joint	Clay	--	--	--	
259	5/7-5K1			326	337	99.4	102.7	gravel	Gravel	--	--	--	
259	5/7-5K1			337	339	102.7	103.3	clay, blue and gravel	Clay and gravel	--	--	--	
260	5/8-1J1	260	5/8-1J1	0	27	0.0	8.2	no record	No data	--	--	--	QTm
260	5/8-1J1			27	44	8.2	13.4	clay, blue	Clay	--	--	--	
260	5/8-1J1			44	49	13.4	14.9	gravel, cement	Gravel	cemented	--	--	
260	5/8-1J1			49	170	14.9	51.8	clay	Clay	--	--	--	
260	5/8-1J1			170	180	51.8	54.9	gravel, cement	Gravel	cemented	--	--	
260	5/8-1J1			180	280	54.9	85.3	clay, blue	Clay	--	--	--	
260	5/8-1J1			280	290	85.3	88.4	gravel, cement	Gravel	cemented	--	--	
261	5/8-1L1	261	5/8-1L1	0	3	0.0	0.9	topsoil	Sand and clay	--	--	--	QTm
261	5/8-1L1			3	22	0.9	6.7	clay, yellow, and rock	Clay and gravel	--	--	--	
261	5/8-1L1			22	30	6.7	9.1	clay, blue	Clay	--	--	--	
261	5/8-1L1			30	47	9.1	14.3	clay, yellow, and rock	Clay and gravel	--	--	--	
								gravel, and clay, blue; 1st water					
261	5/8-1L1			47	52	14.3	15.8	52'	Clay and gravel	--	--	--	
261	5/8-1L1			52	82	15.8	25.0	clay, blue	Clay	--	--	--	
261	5/8-1L1			82	90	25.0	27.4	gravel	Gravel	--	--	--	
261	5/8-1L1			90	105	27.4	32.0	clay, blue, and gravel	Clay and gravel	--	--	--	
261	5/8-1L1			105	110	32.0	33.5	clay, yellow, and gravel	Clay and gravel	--	--	--	
261	5/8-1L1			110	155	33.5	47.2	clay, blue, and gravel	Clay and gravel	--	--	--	
261	5/8-1L1			155	170	47.2	51.8	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
261	5/8-1L1			170	175	51.8	53.3	clay, sandy, blue, and gravel	Clay, sand, and gravel	--	--	--	
261	5/8-1L1			175	202	53.3	61.6	clay, blue	Clay	--	--	--	
261	5/8-1L1			202	205	61.6	62.5	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
261	5/8-1L1			205	211	62.5	64.3	gravel and clay, blue	Clay and gravel	--	--	--	
261	5/8-1L1			211	226	64.3	68.9	clay, blue, jointed	Clay	--	--	--	Tp (?)
261	5/8-1L1			226	253	68.9	77.1	clay, blue	Clay	--	--	--	
262	5/8-13B1	262	5/8-13B1	0	3	0.0	0.9	abode soil	Sand and clay	--	--	--	Qyal and QTm
262	5/8-13B1			3	92	0.9	28.0	sand; first water at 22 feet	Sand	--	--	--	
262	5/8-13B1			92	172	28.0	52.4	sand, blue and gravel	Sand (or sandstone) and gravel	--	--	--	
263	5/7-15K1	263	5/7-15K1	0	5	0.0	1.5	soil	Sand and clay	--	--	--	Qyal and Qoal (?)
263	5/7-15K1			5	15	1.5	4.6	boulders	Gravel	--	--	--	
263	5/7-15K1			15	42	4.6	12.8	yellow clay	Clay	--	--	--	Tp
263	5/7-15K1			42	60	12.8	18.3	clay, blue, no water	Clay	--	--	--	
263	5/7-15K1			60	95	18.3	29.0	yellow sandstone	Sandstone	cemented	--	--	
263	5/7-15K1			95	106	29.0	32.3	blue clay and gravel	Clay and gravel	--	--	--	
264	5/7-20C1	264	5/7-20C1	0	20	0.0	6.1	clay	Clay	--	--	--	Qyal and Qoal (?)
264	5/7-20C1			20	66	6.1	20.1	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
264	5/7-20C1			66	96	20.1	29.3	conglomerate	Clay, sand, and gravel	--	--	--	
264	5/7-20C1			96	202	29.3	61.6	sand and gravel with streaks of clay	Sand (or sandstone) and gravel	--	--	--	
264	5/7-20C1			202	290	61.6	88.4	sandy clay with streaks of sand and gravel	Clay, sand, and trace gravel	--	--	--	
264	5/7-20C1			290	310	88.4	94.5	conglomerate	Clay, sand, and gravel	--	--	--	
264	5/7-20C1			310	315	94.5	96.0	clay	Clay	--	--	--	
264	5/7-20C1			315	322	96.0	98.1	rock (probably cemented sand)	Sandstone	cemented	--	--	QTm
264	5/7-20C1			322	355	98.1	108.2	sandy clay	Clay and sand (or sandstone)	--	--	--	
264	5/7-20C1			355	410	108.2	125.0	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
264	5/7-20C1			410	430	125.0	131.1	rock (probably cemented sand)	Sandstone	cemented	--	--	
264	5/7-20C1			430	435	131.1	132.6	clay, blue	Clay	--	--	--	
264	5/7-20C1			435	506	132.6	154.2	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
264	5/7-20C1			506	513	154.2	156.4	shelf	Sandstone	cemented	--	--	
264	5/7-20C1			513	548	156.4	167.0	clay, hard; with gravel	Clay and gravel	hard	--	--	
264	5/7-20C1			548	558	167.0	170.1	clay, blue and gravel	Clay and gravel	--	--	--	
264	5/7-20C1			558	595	170.1	181.4	free gravel	Gravel	--	--	--	
264	5/7-20C1			595	615	181.4	187.5	clay, soft	Clay	--	--	--	
264	5/7-20C1			615	617	187.5	188.1	shelf (probably cemented sand)	Sandstone	cemented	--	--	
264	5/7-20C1			617	654	188.1	199.3	gravel	Gravel	--	--	--	
264	5/7-20C1			654	658	199.3	200.6	free gravel	Gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
264	5/7-20C1			658	666	200.6	203.0	sand and shelf (probably cemented layers)	Sandstone	cemented	--	--	
264	5/7-20C1			666	675	203.0	205.7	gravel	Gravel	--	--	--	
264	5/7-20C1			675	688	205.7	209.7	gravel, hard	Gravel	hard	--	--	
265	5/7-19N1	265	5/7-19N1	0	6	0.0	1.8	sand	Sand	--	--	--	QTm
265	5/7-19N1			6	15	1.8	4.6	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
265	5/7-19N1			15	25	4.6	7.6	sand, yellow; and gravel; water	Sand (or sandstone) and gravel	--	--	--	
265	5/7-19N1			25	30	7.6	9.1	clay, blue	Clay	--	--	--	
265	5/7-19N1			30	72	9.1	21.9	clay, sandy, yellow and gravel	Clay, sand, and gravel	--	--	--	
265	5/7-19N1			72	75	21.9	22.9	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
265	5/7-19N1			75	90	22.9	27.4	clay, blue	Clay	--	--	--	
265	5/7-19N1			90	105	27.4	32.0	oyster, sandy, blue; and sandstone	Sandstone	cemented	shells	--	
265	5/7-19N1			105	140	32.0	42.7	clay, sandy, blue; and sandstone	Clay and sand (or sandstone)	cemented	--	--	
265	5/7-19N1			140	180	42.7	54.9	sandstone	Clay and sand (or sandstone)	cemented	--	--	
266	5/7-25A1	266	5/7-25A1	0	136	0.0	41.5	no data	No data	--	--	--	Tp
266	5/7-25A1			136	145	41.5	44.2	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
266	5/7-25A1			145	149	44.2	45.4	sand, blue	Sand	--	--	--	
266	5/7-25A1			149	182	45.4	55.5	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
266	5/7-25A1			182	205	55.5	62.5	clay, blue	Clay	--	--	--	
266	5/7-25A1			205	210	62.5	64.0	clay, green	Clay	--	--	--	
266	5/7-25A1			210	241	64.0	73.5	clay, blue	Clay	--	--	--	
266	5/7-25A1			241	265	73.5	80.8	clay, green	Clay	--	--	--	
267	5/7-25C1	267	5/7-25C1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Qoal
267	5/7-25C1			4	25	1.2	7.6	clay, yellow	Clay	--	--	--	
267	5/7-25C1			25	35	7.6	10.7	boulders with water	Gravel	--	--	--	
267	5/7-25C1			35	65	10.7	19.8	blue clay	Clay	--	--	--	
267	5/7-25C1			65	75	19.8	22.9	sand	Sand	--	--	--	
267	5/7-25C1			75	200	22.9	61.0	blue clay	Clay	--	--	--	
267	5/7-25C1			200	225	61.0	68.6	hard sandstone	Sandstone	cemented	--	--	
267	5/7-25C1			225	235	68.6	71.6	sand, water	Sand	--	--	--	
268	5/7-28A3	268	5/7-28A3	0	7	0.0	2.1	adobe	Sand and clay	--	--	--	Qyal and Qoal
268	5/7-28A3			7	75	2.1	22.9	clay, yellow, and gravel	Clay and gravel	--	--	--	
268	5/7-28A3			75	80	22.9	24.4	clay, yellow, sandy	Clay and sand (or sandstone)	--	--	--	
268	5/7-28A3			80	90	24.4	27.4	clay, yellow, sandy and gravel	Clay, sand, and gravel	--	--	--	
268	5/7-28A3			90	125	27.4	38.1	clay, blue	Clay	--	--	--	
268	5/7-28A3			125	148	38.1	45.1	sandstone	Sandstone	cemented	--	--	
268	5/7-28A3			148	186	45.1	56.7	clay, blue	Clay	--	--	--	
268	5/7-28A3			186	220	56.7	67.1	clay, blue, and fine gravel	Clay and gravel	--	--	--	
268	5/7-28A3			220	228	67.1	69.5	sandstone	Sandstone	cemented	--	--	
268	5/7-28A3			228	231	69.5	70.4	gravel	Gravel	--	--	--	
268	5/7-28A3			231	238	70.4	72.5	sandstone	Sandstone	cemented	--	--	
268	5/7-28A3			238	239	72.5	72.8	rock (probably cemented sand)	Sandstone	cemented	--	--	
268	5/7-28A3			239	260	72.8	79.2	clay, blue, and gravel	Clay and gravel	--	--	--	
268	5/7-28A3			260	280	79.2	85.3	clay, blue	Clay	--	--	--	
269	5/7-28H5	269	5/7-28H5	0	6	0.0	1.8	adobe, black, and yellow clay	Sand and clay	--	--	--	Qyal and Qoal
269	5/7-28H5			6	18	1.8	5.5	gravel	Gravel	--	--	--	
269	5/7-28H5			18	25	5.5	7.6	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
269	5/7-28H5			25	75	7.6	22.9	clay, yellow	Clay	--	--	--	
269	5/7-28H5			75	78	22.9	23.8	clay, sandy, yellow, and gravel	Clay, sand, and gravel	--	--	--	
269	5/7-28H5			78	95	23.8	29.0	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
269	5/7-28H5			95	130	29.0	39.6	clay, sandy, blue, and gravel	Clay, sand, and gravel	--	--	--	
269	5/7-28H5			130	198	39.6	60.4	clay, blue	Clay	--	--	--	
269	5/7-28H5			198	208	60.4	63.4	sandstone	Sandstone	cemented	--	--	
269	5/7-28H5			208	213	63.4	64.9	gravel	Gravel	--	--	--	
269	5/7-28H5			213	217	64.9	66.1	sandstone	Sandstone	cemented	--	--	
269	5/7-28H5			217	220	66.1	67.1	gravel	Gravel	--	--	--	
269	5/7-28H5			220	225	67.1	68.6	sandstone	Sandstone	cemented	--	--	QTm
269	5/7-28H5			225	260	68.6	79.2	clay, blue	Clay	--	--	--	

**Appendix 3.** Lithologic data.—Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>	
269	5/7-28H5			260	265	79.2	80.8	clay, blue, and shale	Clay and sand (or sandstone)	cemented	--	--		
269	5/7-28H5			265	276	80.8	84.1	sandstone	Sandstone	cemented	--	--		
269	5/7-28H5			276	277	84.1	84.4	rock	Sandstone	cemented	--	--		
269	5/7-28H5			277	283	84.4	86.3	clay, blue	Clay	--	--	--		
269	5/7-28H5			283	286	86.3	87.2	clay, blue, and gravel	Clay and gravel	--	--	--		
269	5/7-28H5			286	300	87.2	91.4	clay, blue	Clay	--	--	--		
269	5/7-28H5			300	304	91.4	92.7	clay, blue, and gravel	Clay and gravel	--	--	--		
269	5/7-28H5			304	317	92.7	96.6	sandstone	Sandstone	cemented	--	--		
269	5/7-28H5			317	319	96.6	97.2	clay, blue	Clay	--	--	--		
269	5/7-28H5			319	320	97.2	97.5	sandstone	Sandstone	cemented	--	--		
269	5/7-28H5			320	335	97.5	102.1	clay, blue, and gravel	Clay and gravel	--	--	--		
269	5/7-28H5			335	348	102.1	106.1	clay, blue	Clay	--	--	--		
269	5/7-28H5			348	350	106.1	106.7	sandstone	Sandstone	cemented	--	--		
269	5/7-28H5			350	360	106.7	109.7	clay, sandy blue	Clay and sand (or sandstone)	--	--	--		
269	5/7-28H5			360	385	109.7	117.3	clay, blue, gravel, and redwood	Clay and gravel	--	--	wood		
269	5/7-28H5			385	390	117.3	118.9	clay, blue, and gravel	Clay and gravel	--	--	--		
269	5/7-28H5							sandstone, (hard gravel) (parentheses are driller's. Material is probably						
269	5/7-28H5			390	392	118.9	119.5	conglomerate)	Sand (or sandstone) and gravel	cemented	--	--		
269	5/7-28H5			392	398	119.5	121.3	gravel	Gravel	--	--	--		
269	5/7-28H5			398	400	121.3	121.9	rock	Gravel	hard	--	--		
269	5/7-28H5			400	406	121.9	123.7	gravel	Gravel	--	--	--		
269	5/7-28H5			406	408	123.7	124.4	rock	Gravel	hard	--	--		
269	5/7-28H5			408	435	124.4	132.6	clay, blue, gravel, and rock	Clay and gravel	--	--	--		
269	5/7-28H5			435	468	132.6	142.6	clay, gray hard, compact	Clay and gravel	hard	--	--	Tp (?)	
270	5/7-28H1	270	5/7-28H1	0	7	0.0	2.1	topsoil, adobe	Sand and clay	--	--	--	Qyal and Qoal	
270	5/7-28H1			7	45	2.1	13.7	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--		
270	5/7-28H1			45	66	13.7	20.1	yellow clay	Clay	--	--	--		
270	5/7-28H1			66	75	20.1	22.9	blue clay	Clay	--	--	--		
270	5/7-28H1			75	79	22.9	24.1	yellow sand and gravel	Sand (or sandstone) and gravel	--	--	--		
270	5/7-28H1			79	84	24.1	25.6	yellow sandy clay	Clay and sand (or sandstone)	--	--	--		
270	5/7-28H1			84	112	25.6	34.1	blue clay	Clay	--	--	--		
270	5/7-28H1			112	115	34.1	35.1	yellow sand and fine gravel	Sand (or sandstone) and gravel	--	--	--		
270	5/7-28H1			115	154	35.1	46.9	blue clay	Clay	--	--	--		
270	5/7-28H1			154	181	46.9	55.2	blue cemented gravel	Gravel	cemented	--	--	QTm (?)	
270	5/7-28H1			181	250	55.2	76.2	blue clay	Clay	--	--	--		
270	5/7-28H1			250	274	76.2	83.5	blue clay and gravel	Clay and gravel	--	--	--		
270	5/7-28H1			274	460	83.5	140.2	blue clay and boulders	Clay and gravel	--	--	--		
270	5/7-28H1			460	483	140.2	147.2	blue clay	Clay	--	--	--		
271	5/7-26R1	271	5/7-26R1	0	20	0.0	6.1	clay, adobe, yellow	Sand and clay	--	--	--	Qyal and Qoal	
271	5/7-26R1			20	75	6.1	22.9	sandy, coarse, and gravel	Sand (or sandstone) and gravel	--	--	--		
271	5/7-26R1			75	110	22.9	33.5	clay, gray, sandy	Clay and sand (or sandstone)	--	--	--		
271	5/7-26R1			110	120	33.5	36.6	sandy	Clay	--	--	--		
271	5/7-26R1			120	160	36.6	48.8	clay, yellow, sandy; and wood	Clay and sand (or sandstone)	--	--	wood		
271	5/7-26R1			160	180	48.8	54.9	clay, yellow, sandy	Clay and sand (or sandstone)	--	--	--		
271	5/7-26R1			180	200	54.9	61.0	clay, gray, sandy	Clay and sand (or sandstone)	--	--	--		
271	5/7-26R1			200	210	61.0	64.0	wood	No data	--	--	wood		
271	5/7-26R1			210	220	64.0	67.1	clay, rusty, sandy	Clay and sand (or sandstone)	--	--	--	QTm (?)	
271	5/7-26R1			220	230	67.1	70.1	clay, gray, sandy	Clay and sand (or sandstone)	--	--	--		
271	5/7-26R1			230	240	70.1	73.2	bentonite	Clay	--	--	--		
271	5/7-26R1			240	270	73.2	82.3	shale, gray, sandy	Clay and sand (or sandstone)	cemented	--	--		
271	5/7-26R1			270	280	82.3	85.3	clay, gray	Clay	--	--	--		
271	5/7-26R1			280	300	85.3	91.4	clay, gray, sandy	Clay and sand (or sandstone)	--	--	--		
271	5/7-26R1			300	315	91.4	96.0	gravel	Gravel	--	--	--		
271	5/7-26R1			315	440	96.0	134.1	clay, gray	Clay	--	--	--		
271	5/7-26R1			440	450	134.1	137.2	clay, gray, and hard gray rock	Clay and gravel	hard	--	--		
271	5/7-26R1			450	470	137.2	143.3	gravel, fine	Gravel	--	--	--		
271	5/7-26R1			470	490	143.3	149.4	shale and rock, gray	Clay and sand (or sandstone)	cemented	--	--	Tp (?)	
271	5/7-26R1			490	530	149.4	161.5	shale, muddy	Clay and sand (or sandstone)	cemented	--	--		
271	5/7-26R1			530	600	161.5	182.9	clay, gray	Clay	--	--	--		

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
271	5/7-26R1			600	680	182.9	207.3	clay mud, gray	Clay and sand (or sandstone)	--	--	--	
271	5/7-26R1			680	800	207.3	243.8	shale, gray	Clay and sand (or sandstone)	cemented	--	--	
271	5/7-26R1			800	835	243.8	254.5	Franciscan	Undifferentiated basement	--	--	--	
272	5/7-35H1	272	5/7-35H1	0	5	0.0	1.5	adobe	Sand and clay	--	--	--	KJu Qyal and Qoal (?)
272	5/7-35H1			5	15	1.5	4.6	sand, coarse, and small gravel; bottomed in yellow clay	Sand (or sandstone) and gravel	--	--	--	
272	5/7-35H1			15	30	4.6	9.1	clay, yellow	Clay	--	--	--	
272	5/7-35H1			30	35	9.1	10.7	gravel, small and coarse sand sand, coarse; bottomed in yellow	Sand (or sandstone) and gravel	--	--	--	
272	5/7-35H1			35	40	10.7	12.2	clay	Sand and clay	--	--	--	
272	5/7-35H1			40	50	12.2	15.2	clay, yellow	Clay	--	--	--	
272	5/7-35H1			50	70	15.2	21.3	gravel streaks in yellow clay sand, coarse streaks in yellow	Clay and gravel	--	--	--	
272	5/7-35H1			70	80	21.3	24.4	clay	Sand and clay	--	--	--	
272	5/7-35H1			80	90	24.4	27.4	clay, yellow, changing to blue	Clay	--	--	--	
272	5/7-35H1			90	110	27.4	33.5	clay, blue	Clay	--	--	--	
272	5/7-35H1			110	120	33.5	36.6	clay, blue changing to yellow clay	Clay	--	--	--	
272	5/7-35H1			120	160	36.6	48.8	clay, yellow	Clay	--	--	--	
272	5/7-35H1			160	170	48.8	51.8	clay, blue	Clay	--	--	--	
272	5/7-35H1			170	180	51.8	54.9	clay, blue, brown spots sand, coarse, and fine; some	Clay	--	--	--	
272	5/7-35H1			180	190	54.9	57.9	shell fossils	Sand	--	shells	--	QTm (?)
272	5/7-35H1			190	200	57.9	61.0	gravel, small; shell fossils gravel, small, and fine sand; firm,	Gravel	--	shells	--	
272	5/7-35H1			200	210	61.0	64.0	but friable	Sand (or sandstone) and gravel	--	--	--	
272	5/7-35H1			210	290	64.0	88.4	clay, blue tan spots	Clay	--	--	--	
272	5/7-35H1			290	440	88.4	134.1	clay, blue	Clay	--	--	--	
272	5/7-35H1			440	460	134.1	140.2	clay, blue some very small gravel	Clay and gravel	--	--	--	
272	5/7-35H1			460	480	140.2	146.3	clay, blue some grit	Clay and sand (or sandstone)	--	--	--	
272	5/7-35H1			480	487	146.3	148.4	clay, blue	Clay	--	--	--	
272	5/7-35H1			487	512	148.4	156.1	gravel, small	Gravel	--	--	--	
272	5/7-35H1			512	529	156.1	161.2	shell, very hard	Sand	hard	shells	--	Tp
272	5/7-35H1			529	540	161.2	164.6	shale, blue	Clay and sand (or sandstone)	cemented	--	--	
272	5/7-35H1			540	542	164.6	165.2	shale, blue gravel, small	Clay, sand, and trace gravel	cemented	--	--	
273	5/7-33M1	273	5/7-33M1	0	21	0.0	6.4	no record	No data	--	--	--	QTm
273	5/7-33M1			21	21	6.4	6.4	gravel, water	Gravel	--	--	--	
273	5/7-33M1			21	50	6.4	15.2	clay, blue, and gravel	Clay and gravel	--	--	--	
273	5/7-33M1			50	90	15.2	27.4	clay, blue	Clay	--	--	--	
273	5/7-33M1			90	132	27.4	40.2	rock	Gravel	hard	--	--	Tsv
274	5/7-33Q1	274	5/7-33Q1	0	30	0.0	9.1	sand and clay, yellow	Clay	--	--	--	Qyal
274	5/7-33Q1			30	35	9.1	10.7	sand and gravel (water)	Sand (or sandstone) and gravel	--	--	--	
274	5/7-33Q1			35	65	10.7	19.8	clay, blue	Clay	--	--	--	
274	5/7-33Q1			65	125	19.8	38.1	sandstone, blue; water	Sandstone	cemented	--	--	QTm
274	5/7-33Q1			125	135	38.1	41.1	rock, sand	Sandstone	cemented	--	--	
274	5/7-33Q1			135	145	41.1	44.2	rock, blue	Sandstone	hard	--	--	KJu
274	5/7-33Q1			145	150	44.2	45.7	rock, serpentine	Undifferentiated basement	hard	--	--	
274	5/7-33Q1			150	155	45.7	47.2	rock, blue, and clay	Undifferentiated basement	hard	--	--	
274	5/7-33Q1			155	160	47.2	48.8	gravel, cement; (water)	Undifferentiated basement	cemented	--	--	
274	5/7-33Q1			160	170	48.8	51.8	rock, sand, and clay	Undifferentiated basement	hard	--	--	
274	5/7-33Q1			170	175	51.8	53.3	clay, blue, and rock	Undifferentiated basement	--	--	--	
274	5/7-33Q1			175	185	53.3	56.4	rock, blue, cracked	Undifferentiated basement	hard	--	--	
274	5/7-33Q1			185	205	56.4	62.5	rock and clay	Undifferentiated basement	--	--	--	
275	5/7-32R1	275	5/7-32R1	0	2	0.0	0.6	adobe	Sand and clay	--	--	--	Tsv
275	5/7-32R1			2	80	0.6	24.4	rock, decomposed, yellow	Sandstone	hard	--	--	
275	5/7-32R1			80	107	24.4	32.6	rock, decomposed, blue	Sandstone	hard	--	--	
275	5/7-32R1			107	111	32.6	33.8	rock, decomposed, yellow	Sandstone	hard	--	--	
275	5/7-32R1			111	130	33.8	39.6	rock, green	Undifferentiated basement	hard	--	--	KJu
275	5/7-32R1			130	200	39.6	61.0	rock, blue	Undifferentiated basement	hard	--	--	
275	5/7-32R1			200	217	61.0	66.1	rock, blue, with soft streaks	Undifferentiated basement	hard	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
276	4/6-27L1	276	4/6-27L1	0	15	0.0	4.6	no data	No data	--	--	--	Qyal and Qoal (?) and QTge
276	4/6-27L1			15	98	4.6	29.9	soil, clay, and gravel	Clay, sand, and gravel	--	--	--	
276	4/6-27L1			98	102	29.9	31.1	gravel	Gravel	--	--	--	
276	4/6-27L1			102	158	31.1	48.2	clay, yellow; and gravel	Clay and gravel	--	--	--	
276	4/6-27L1			158	175	48.2	53.3	sand, blue	Sand	--	--	--	
276	4/6-27L1			175	235	53.3	71.6	clay, blue	Clay	--	--	--	
276	4/6-27L1			235	245	71.6	74.7	clay, yellow	Clay	--	--	--	
276	4/6-27L1			245	253	74.7	77.1	clay, blue	Clay	--	--	--	
276	4/6-27L1			253	295	77.1	89.9	clay, yellow	Clay	--	--	--	
276	4/6-27L1			295	320	89.9	97.5	sand, yellow; (dry)	Sand	--	--	--	
276	4/6-27L1			320	357	97.5	108.8	clay, yellow	Clay	--	--	--	
276	4/6-27L1			357	359	108.8	109.4	gravel, pea	Gravel	--	--	--	
276	4/6-27L1			359	450	109.4	137.2	clay, hard, yellow	Clay	hard	--	--	
276	4/6-27L1			450	460	137.2	140.2	conglomerate	Clay, sand, and gravel	--	--	--	
276	4/6-27L1			460	485	140.2	147.8	clay, yellow	Clay	--	--	--	
276	4/6-27L1			485	500	147.8	152.4	gravel	Gravel	--	--	--	
277	6/6-10F1	277	6/6-10F1	0	102	0.0	31.1	hardpan and boulders	Clay and gravel	hard	--	--	QTge
277	6/6-10F1			102	350	31.1	106.7	rock, decomposed; not hard dirt, gravel and clay, yellow- mixture	Ash or tuff	hard	--	--	Tsv
278	6/6-16J2	278	6/6-16J2	0	2	0.0	0.6	no record	Clay, sand, and gravel	--	--	--	QTge
278	6/6-16J2			2	39	0.6	11.9	hardpan, boulders	Clay and gravel	hard	--	--	
278	6/6-16J2			39	51	11.9	15.5	boulders and clay	Clay and gravel	--	--	--	
278	6/6-16J2			51	56	15.5	17.1	boulders	Gravel	--	--	--	
278	6/6-16J2			56	93	17.1	28.3	clay, yellow	Clay	--	--	--	
278	6/6-16J2			93	137	28.3	41.8	clay, blue	Clay	--	--	--	
278	6/6-16J2			137	160	41.8	48.8	clay, yellow	Clay	--	--	--	
278	6/6-16J2			160	200	48.8	61.0	shale, blue and gravel	Clay and sand (or sandstone)	cemented	--	--	
278	6/6-16J2			200	280	61.0	85.3	no record	No data	--	--	--	
279	6/6-22R3	279	6/6-22R3	0	90	0.0	27.4	clay, yellow	Clay	--	--	--	QTge
279	6/6-22R3			90	167	27.4	50.9	clay, blue	Clay	--	--	--	
279	6/6-22R3			167	215	50.9	65.5	quicksand	Sand and clay	--	--	--	
279	6/6-22R3			215	276	65.5	84.1	clay, yellow	Clay	--	--	--	
279	6/6-22R3			276	316	84.1	96.3	clay, blue	Clay	--	--	--	
279	6/6-22R3			316	418	96.3	127.4	solid rock	Ash or tuff	--	--	--	Tsv
280	6/6-26E1	280	6/6-26E1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Qoal and QTge
280	6/6-26E1			4	94	1.2	28.7	"hardpan"	Clay and gravel	hard	--	--	
280	6/6-26E1			94	108	28.7	32.9	gravel cement	Gravel	cemented	--	--	
280	6/6-26E1			108	181	32.9	55.2	clay, yellow sandy	Clay and sand (or sandstone)	--	--	--	
280	6/6-26E1			181	204	55.2	62.2	gravel and clay	Clay and gravel	--	--	--	
280	6/6-26E1			204	241	62.2	73.5	"shale"	Clay and sand (or sandstone)	cemented	--	--	Tsv
280	6/6-26E1			241	304	73.5	92.7	rock drilling	Ash or tuff	--	--	--	
281	6/6-34C1	281	6/6-34C1	0	23	0.0	7.0	clay, yellow	Clay	--	--	--	QTge
281	6/6-34C1			23	25	7.0	7.6	gravel and sand	Sand (or sandstone) and gravel	--	--	--	
281	6/6-34C1			25	229	7.6	69.8	clay, yellow and gray	Clay	--	--	--	
281	6/6-34C1			229	343	69.8	104.5	clay, yellow	Clay	--	--	--	
281	6/6-34C1			343	500	104.5	152.4	mixture sand	Clay and sand (or sandstone)	--	--	--	
282	5/5-8B1	282	5/5-8B1	0	43	0.0	13.1	dirt and gravel	Clay, sand, and gravel	--	--	--	Qoal
282	5/5-8B1			43	63	13.1	19.2	hardpan	Clay and gravel	hard	--	--	
282	5/5-8B1			63	80	19.2	24.4	gravel cement	Gravel	cemented	--	--	
283	5/5-8A1	283	5/5-8A1	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Qoal
283	5/5-8A1			2	19	0.6	5.8	boulder and clay	Clay and gravel	--	--	--	
283	5/5-8A1			19	54	5.8	16.5	clay, yellow	Clay	--	--	--	Qh
283	5/5-8A1			54	94	16.5	28.7	shale, blue	Clay and sand (or sandstone)	cemented	--	--	
283	5/5-8A1			94	124	28.7	37.8	rock, yellow, soft	Ash or tuff	hard	--	--	Tsv
283	5/5-8A1			124	136	37.8	41.5	rock, red some water	Ash or tuff	hard	--	--	
283	5/5-8A1			136	157	41.5	47.9	rock, black and red	Ash or tuff	hard	--	--	
283	5/5-8A1			157	175	47.9	53.3	rock, red	Ash or tuff	hard	--	--	
284	5/5-7A1	284	5/5-7A1	0	10	0.0	3.0	"surface" boulders	Sand (or sandstone) and gravel	--	--	--	Tsv
284	5/5-7A1			10	85	3.0	25.9	clay, red and boulders	Clay and gravel	--	--	--	
284	5/5-7A1			85	150	25.9	45.7	volcanic ash, red	Ash or tuff	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
284	5/5-7A1			150	160	45.7	48.8	lava boulders	Basalt	--	--	--	
284	5/5-7A1			160	195	48.8	59.4	volcanic ash, red	Ash or tuff	--	--	--	
284	5/5-7A1			195	230	59.4	70.1	clay, brown, and cemented gravel	Clay and gravel	cemented	--	--	
284	5/5-7A1			230	325	70.1	99.1	tuff, white	Ash or tuff	--	--	--	
284	5/5-7A1			325	340	99.1	103.6	tuff white	Ash or tuff	--	--	--	
284	5/5-7A1			340	475	103.6	144.8	lava rock	Basalt	hard	--	--	
284	5/5-7A1			475	560	144.8	170.7	cemented sand with streaks of clay and sandstone	Sandstone	cemented	--	--	
284	5/5-7A1			560	575	170.7	175.3	clay, yellow, and sand	Clay and gravel	--	--	--	
285	5/5-8E1	285	5/5-8E1	0	116	0.0	35.4	"hardpan"	Clay and gravel	hard	--	--	Qoal and Qh Tsv
285	5/5-8E1			116	155	35.4	47.2	rock, basalt	Basalt	--	--	--	
285	5/5-8E1			155	170	47.2	51.8	rock, red volcanic, water bearing'	Ash or tuff	hard	--	--	
285	5/5-8E1			170	212	51.8	64.6	rock, soft, porous	Ash or tuff	hard	--	--	
285	5/5-8E1			212	235	64.6	71.6	volcanic ash, red	Ash or tuff	--	--	--	
286	5/5-9M1	286	5/5-9M1	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Qoal
286	5/5-9M1			2	37	0.6	11.3	"hardpan"	Clay and gravel	hard	--	--	
286	5/5-9M1			37	107	11.3	32.6	clay, yellow	Clay	--	--	--	Qh
286	5/5-9M1			107	149	32.6	45.4	clay, blue	Clay	--	--	--	
286	5/5-9M1			149	184	45.4	56.1	clay, yellow	Clay	--	--	--	
286	5/5-9M1			184	215	56.1	65.5	rock drilling	Ash or tuff	--	--	--	Tsv
287	5/6-10K1	287	5/6-10K1	0	70	0.0	21.3	"hardpan" and boulders	Clay and gravel	hard	--	--	Qoal
287	5/6-10K1			70	155	21.3	47.2	clay, yellow and boulders	Clay and gravel	--	--	--	QTge
287	5/6-10K1			155	237	47.2	72.2	clay, blue	Clay	--	--	--	
287	5/6-10K1			237	239	72.2	72.8	sand, blue	Sand	--	--	--	
288	5/5-9N2	288	5/5-9N2	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Qoal and Qh
288	5/5-9N2			2	77	0.6	23.5	clay, yellow	Clay	--	--	--	
288	5/5-9N2			77	285	23.5	86.9	clay, blue, and sand	Clay and sand (or sandstone)	--	--	--	
289	5/5-8P1	289	5/5-8P1	0	8	0.0	2.4	soil	Sand and clay	--	--	--	Qoal
289	5/5-8P1			8	61	2.4	18.6	clay, yellow, and gravel	Clay and gravel	--	--	--	
289	5/5-8P1			61	234	18.6	71.3	clay, yellow	Clay	--	--	--	Qh
289	5/5-8P1			234	236	71.3	71.9	sand brown, little water	Sand	--	--	--	
289	5/5-8P1			236	333	71.9	101.5	clay, blue	Clay	--	--	--	
289	5/5-8P1			333	403	101.5	122.8	shale, blue and sand	Clay and sand (or sandstone)	cemented	--	--	
289	5/5-8P1			403	421	122.8	128.3	rock formation, water bearing	Ash or tuff	--	--	--	Tsv
290	5/5-17B1	290	5/5-17B1	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Qoal
290	5/5-17B1			2	30	0.6	9.1	hardpan and clay	Clay and gravel	hard	--	--	
290	5/5-17B1			30	180	9.1	54.9	clay, yellow	Clay	--	--	--	Qh
290	5/5-17B1			180	710	54.9	216.4	clay, blue	Clay	--	--	--	
290	5/5-17B1			710	715	216.4	217.9	clay, reddish and some scoria	Clay	--	--	--	Tsv (?)
290	5/5-17B1			715	720	217.9	219.5	clay, blue	Clay	--	--	--	
291	5/5-17C4	291	5/5-17C4	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Qoal
291	5/5-17C4			4	22	1.2	6.7	gravel and clay	Clay and gravel	--	--	--	
291	5/5-17C4			22	79	6.7	24.1	clay, yellow	Clay	--	--	--	Qh
291	5/5-17C4			79	149	24.1	45.4	clay, blue	Clay	--	--	--	
291	5/5-17C4			149	249	45.4	75.9	clay, blue and yellow	Clay	--	--	--	
291	5/5-17C4			249	265	75.9	80.8	clay, blue	Clay	--	--	--	
292	5/6-14B2	292	5/6-14B2	0	1	0.0	0.3	soil	Sand and clay	--	--	--	Qyal
292	5/6-14B2			1	5	0.3	1.5	topsoil and gravel	Sand and clay	--	--	--	
292	5/6-14B2							gravel and boulders, water					
292	5/6-14B2			5	98	1.5	29.9	bearing	Gravel	--	--	--	
292	5/6-14B2			98	147	29.9	44.8	clay, yellow and boulders	Clay and gravel	--	--	--	Qoal
292	5/6-14B2			147	200	44.8	61.0	clay, blue	Clay	--	--	--	QTge
293	5/5-16E1	293	5/5-16E1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qoal and Qh
293	5/5-16E1			3	22	0.9	6.7	rock	Gravel	hard	--	--	
293	5/5-16E1			22	100	6.7	30.5	clay, yellow	Clay	--	--	--	
293	5/5-16E1			100	101	30.5	30.8	sand, little water	Sand	--	--	--	
293	5/5-16E1			101	245	30.8	74.7	clay, blue	Clay	--	--	--	
293	5/5-16E1			245	322	74.7	98.1	clay, yellow	Clay	--	--	--	
293	5/5-16E1			322	336	98.1	102.4	clay, blue	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
293	5/5-16E1			336	386	102.4	117.7	shale, blue	Clay and sand (or sandstone)	cemented	--	--	
293	5/5-16E1			386	393	117.7	119.8	shale and sand	Clay and sand (or sandstone)	cemented	--	--	
294	5/6-13F1	294	5/6-13F1	0	32	0.0	9.8	clay	Clay	--	--	--	Qyal and Qoal
294	5/6-13F1			32	48	9.8	14.6	gravel	Gravel	--	--	--	
294	5/6-13F1			48	68	14.6	20.7	gravel and clay	Clay and gravel	--	--	--	
294	5/6-13F1			68	69	20.7	21.0	gravel	Gravel	--	--	--	
294	5/6-13F1			69	80	21.0	24.4	gravel and clay	Clay and gravel	--	--	--	
294	5/6-13F1			80	100	24.4	30.5	gravel	Gravel	--	--	--	
294	5/6-13F1			100	108	30.5	32.9	clay	Clay	--	--	--	
294	5/6-13F1			108	110	32.9	33.5	clay	Clay	--	--	--	
295	5/6-13F2	295	5/6-13F2	0	36	0.0	11.0	clay	Clay	--	--	--	Qyal and Qoal
295	5/6-13F2			36	46	11.0	14.0	clay, sand	Clay and sand (or sandstone)	--	--	--	
295	5/6-13F2			46	62	14.0	18.9	gravel	Gravel	--	--	--	
295	5/6-13F2			62	65	18.9	19.8	gravel and clay	Clay and gravel	--	--	--	
295	5/6-13F2			65	73	19.8	22.3	gravel	Gravel	--	--	--	
295	5/6-13F2			73	82	22.3	25.0	gravel and clay	Clay and gravel	--	--	--	
295	5/6-13F2			82	94	25.0	28.7	gravel	Gravel	--	--	--	
295	5/6-13F2			94	98	28.7	29.9	gravel and clay	Clay and gravel	--	--	--	
295	5/6-13F2			98	102	29.9	31.1	gravel	Gravel	--	--	--	
295	5/6-13F2			102	105	31.1	32.0	clay	Clay	--	--	--	
296	5/5-17J1	296	5/5-17J1	0	42	0.0	12.8	clay, sandy	Clay and sand (or sandstone)	--	--	--	Qoal
296	5/5-17J1			42	60	12.8	18.3	clay, yellow	Clay	--	--	--	Qh
296	5/5-17J1			60	139	18.3	42.4	clay, blue	Clay	--	--	--	
296	5/5-17J1			139	150	42.4	45.7	clay, yellow	Clay	--	--	--	
296	5/5-17J1			150	192	45.7	58.5	clay, blue	Clay	--	--	--	
296	5/5-17J1			192	229	58.5	69.8	clay, yellow	Clay	--	--	--	
296	5/5-17J1			229	281	69.8	85.6	clay, blue	Clay	--	--	--	
296	5/5-17J1			281	285	85.6	86.9	gravel	Gravel	--	--	--	
297	5/5-18K1	297	5/5-18K1	0	39	0.0	11.9	mixture	Clay, sand, and gravel	--	--	--	Qoal
297	5/5-18K1			39	84	11.9	25.6	clay, yellow and sand	Clay and sand (or sandstone)	--	--	--	
297	5/5-18K1			84	94	25.6	28.7	clay, blue	Clay	--	--	--	
297	5/5-18K1			94	110	28.7	33.5	clay, blue, sand and gravel	Clay, sand, and gravel	--	--	--	
297	5/5-18K1			110	128	33.5	39.0	sand, blue and gravel	Sand (or sandstone) and gravel	--	--	--	
298	5/5-17N1	298	5/5-17N1	0	10	0.0	3.0	surface	Sand and clay	--	--	--	Qoal
298	5/5-17N1			10	165	3.0	50.3	clay, yellow, sand and gravel	Clay, sand, and gravel	--	--	--	
298	5/5-17N1			165	290	50.3	88.4	clay, yellow	Clay	--	--	--	Qh
298	5/5-17N1			290	445	88.4	135.6	clay, blue	Clay	--	--	--	
298	5/5-17N1			445	455	135.6	138.7	volcanic rock	Ash or tuff	--	--	--	
298	5/5-17N1			455	475	138.7	144.8	sand fine	Sand	--	--	--	
299	5/5-17R2	299	5/5-17R2	0	1	0.0	0.3	soil	Sand and clay	--	--	--	Qoal and Qh
299	5/5-17R2			1	141	0.3	43.0	clay, gray	Clay	--	--	--	
299	5/5-17R2			70	104	21.3	31.7	gravel	Gravel	--	--	--	
299	5/5-17R2			84	94	25.6	28.7	clay, blue	Clay	--	--	--	
299	5/5-17R2			94	110	28.7	33.5	clay, blue, sand and gravel	Clay, sand, and gravel	--	--	--	
299	5/5-17R2			104	124	31.7	37.8	clay, yellow	Clay	--	--	--	
299	5/5-17R2			110	128	33.5	39.0	sand, blue and gravel	Sand (or sandstone) and gravel	--	--	--	
299	5/5-17R2			124	150	37.8	45.7	gravel	Gravel	--	--	--	
299	5/5-17R2			128	70	39.0	21.3	hardpan and clay	Clay and gravel	hard	--	--	
299	5/5-17R2			141	151	43.0	46.0	clay, blue	Clay	--	--	--	
299	5/5-17R2			151	161	46.0	49.1	clay, brown	Clay	--	--	--	
299	5/5-17R2			161	191	49.1	58.2	clay, gray	Clay	--	--	--	
299	5/5-17R2			191	206	58.2	62.8	clay, brown	Clay	--	--	--	
299	5/5-17R2			206	230	62.8	70.1	clay, blue	Clay	--	--	--	
299	5/5-17R2			230	246	70.1	75.0	clay, brown	Clay	--	--	--	
299	5/5-17R2			246	296	75.0	90.2	clay, blue	Clay	--	--	--	
299	5/5-17R2			296	300	90.2	91.4	clay, brown	Clay	--	--	--	
299	5/5-17R2			300	324	91.4	98.8	clay, brown	Clay	--	--	--	
299	5/5-17R2			324	341	98.8	103.9	gravel, cemented	Gravel	cemented	--	--	
299	5/5-17R2			341	359	103.9	109.4	not described	No data	--	--	--	
299	5/5-17R2			359	84	109.4	25.6	clay, yellow and sand	Clay and sand (or sandstone)	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
300	5/5-21E1	300	5/5-21E1	0	215	0.0	65.5	clay, blue	Clay	--	--	--	Qh
300	5/5-21E1			215	221	65.5	67.4	gravel free	Clay	--	--	--	
300	5/5-21E1			221	250	67.4	76.2	gravel, cemented and boulders	Gravel	cemented	--	--	
301	5/6-24K1	301	5/6-24K1	0	3	0.0	0.9	"Adobe" and sand	Sand and clay	--	--	--	Qyal and Qoal
301	5/6-24K1			3	22	0.9	6.7	gravel.	Gravel	--	--	--	
301	5/6-24K1			22	41	6.7	12.5	gravel	Gravel	--	--	--	
301	5/6-24K1			41	51	12.5	15.5	gravel	Gravel	--	--	--	
301	5/6-24K1			51	92	15.5	28.0	clay, yellow	Clay	--	--	--	
301	5/6-24K1			92	99	28.0	30.2	gravel	Gravel	--	--	--	
301	5/6-24K1			99	133	30.2	40.5	clay, yellow	Clay	--	--	--	
301	5/6-24K1			133	140	40.5	42.7	gravel and clay	Clay and gravel	--	--	--	
301	5/6-24K1			140	151	42.7	46.0	clay, yellow	Clay	--	--	--	
302	5/5-22L1	302	5/5-22L1	0	5	0.0	1.5	soil	Sand and clay	--	--	--	Qh
302	5/5-22L1			5	150	1.5	45.7	clay, yellow	Clay	--	--	--	
302	5/5-22L1			150	156	45.7	47.5	gravel and sand	Sand (or sandstone) and gravel	--	--	--	
302	5/5-22L1			156	225	47.5	68.6	clay, yellow	Clay	--	--	--	
302	5/5-22L1			225	280	68.6	85.3	clay, blue	Clay	--	--	--	
302	5/5-22L1			280	290	85.3	88.4	sand, blue	Sand	--	--	--	
302	5/5-22L1			290	330	88.4	100.6	lava rock, blue	Basalt	hard	--	--	Tsv
302	5/5-22L1			330	400	100.6	121.9	lava rock, red	Basalt	hard	--	--	
302	5/5-22L1			400	560	121.9	170.7	not described	No data	--	--	--	
303	5/5-19L5	303	5/5-19L5	0	37	0.0	11.3	hardpan and sand	Clay and gravel	hard	--	--	Qoal
303	5/5-19L5			37	60	11.3	18.3	clay, yellow	Clay	--	--	--	
303	5/5-19L5			60	65	18.3	19.8	gravel and sand	Sand (or sandstone) and gravel	--	--	--	
304	5/5-22L2	304	5/5-22L2	0	6	0.0	1.8	soil	Sand and clay	--	--	--	Qh
304	5/5-22L2			6	70	1.8	21.3	clay, yellow	Clay	--	--	--	
304	5/5-22L2			70	135	21.3	41.1	lava rock, red	Basalt	hard	--	--	Tsv
304	5/5-22L2			135	155	41.1	47.2	volcanic ash, green	Ash or tuff	--	--	--	
304	5/5-22L2			155	200	47.2	61.0	lava rock, hard, black	Basalt	hard	--	--	
304	5/5-22L2			200	212	61.0	64.6	lava rock brown	Basalt	hard	--	--	
305	5/5-19L1	305	5/5-19L1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qoal and Qh (?)
305	5/5-19L1			3	70	0.9	21.3	hardpan and clay	Clay and gravel	hard	--	--	
305	5/5-19L1			70	104	21.3	31.7	gravel	Gravel	--	--	--	
305	5/5-19L1			104	124	31.7	37.8	clay, yellow	Clay	--	--	--	
305	5/5-19L1			124	150	37.8	45.7	gravel	Gravel	--	--	--	
306	5/5-22Q1	306	5/5-22Q1	0	10	0.0	3.0	soil	Sand and clay	--	--	--	Qh
306	5/5-22Q1			10	30	3.0	9.1	clay, yellow	Clay	--	--	--	
306	5/5-22Q1			30	45	9.1	13.7	clay, blue and sand	Clay and sand (or sandstone)	--	--	--	
306	5/5-22Q1			45	75	13.7	22.9	clay, yellow, boulders	Clay and gravel	--	--	--	
306	5/5-22Q1			75	100	22.9	30.5	clay, blue and sand	Clay and sand (or sandstone)	--	--	--	
306	5/5-22Q1			100	130	30.5	39.6	clay, yellow and sand	Clay and sand (or sandstone)	--	--	--	
306	5/5-22Q1			130	215	39.6	65.5	clay, yellow and boulders	Clay and gravel	--	--	--	
306	5/5-22Q1			215	265	65.5	80.8	clay, brown and boulders	Clay and gravel	--	--	--	
306	5/5-22Q1			265	300	80.8	91.4	clay, blue and boulders	Clay and gravel	--	--	--	
306	5/5-22Q1			300	315	91.4	96.0	gravel and sand	Sand (or sandstone) and gravel	--	--	--	
306	5/5-22Q1			315	320	96.0	97.5	clay, brown	Clay	--	--	--	
306	5/5-22Q1			320	500	97.5	152.4	clay, blue, sand, shattered rock St. Helena rhyolite member,	Clay, sand, and gravel	--	--	--	
306	5/5-22Q1			500	542	152.4	165.2	basalt	Ash or tuff	--	--	--	Tsv
307	5/5-20R1	307	5/5-20R1	0	10	0.0	3.0	sand and dirt	Sand and clay	--	--	--	Qoal
307	5/5-20R1			10	100	3.0	30.5	clay, yellow	Clay	--	--	--	Qh
307	5/5-20R1			100	125	30.5	38.1	clay, green-yellow	Clay	--	--	--	
307	5/5-20R1			125	127	38.1	38.7	water strata	Clay	--	--	--	
307	5/5-20R1			127	200	38.7	61.0	clay, green colored	Clay	--	--	--	
307	5/5-20R1			200	250	61.0	76.2	clay, blue	Clay	--	--	--	
307	5/5-20R1			250	275	76.2	83.8	clay, blue and sand	Clay and sand (or sandstone)	--	--	--	
307	5/5-20R1			275	300	83.8	91.4	clay, green colored	Clay	--	--	--	
307	5/5-20R1			300	350	91.4	106.7	clay, light blue	Clay	--	--	--	
307	5/5-20R1			350	400	106.7	121.9	clay, blue and gray colored	Clay	--	--	--	
307	5/5-20R1			400	450	121.9	137.2	clay, green colored	Clay	--	--	--	
307	5/5-20R1			450	475	137.2	144.8	clay, blue	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
307	5/5-20R1			475	500	144.8	152.4	clay, blue	Clay	--	--	--	
307	5/5-20R1			500	504	152.4	153.6	clay, blue with sand	Clay and sand (or sandstone)	--	--	--	
308	5/5-21R1	308	5/5-21R1	0	7	0.0	2.1	soil	Sand and clay	--	--	--	QaI
308	5/5-21R1			7	46	2.1	14.0	clay, sandy	Clay and sand (or sandstone)	--	--	--	
308	5/5-21R1			46	116	14.0	35.4	clay, yellow	Clay	--	--	--	Qh
308	5/5-21R1			116	166	35.4	50.6	clay, blue	Clay	--	--	--	
308	5/5-21R1			166	236	50.6	71.9	clay, yellow	Clay	--	--	--	
308	5/5-21R1			236	242	71.9	73.8	clay, blue	Clay	--	--	--	
309	5/5-30E1	309	5/5-30E1	0	10	0.0	3.0	soil	Sand and clay	--	--	--	
309	5/5-30E1			10	30	3.0	9.1	clay, blue	Clay	--	--	--	
309	5/5-30E1			30	50	9.1	15.2	gravel, free	Gravel	--	--	--	
309	5/5-30E1			50	150	15.2	45.7	clay, yellow, sand and gravel	Clay, sand, and gravel	--	--	--	
309	5/5-30E1			150	225	45.7	68.6	clay, blue	Clay	--	--	--	
309	5/5-30E1			225	350	68.6	106.7	clay, yellow	Clay	--	--	--	
309	5/5-30E1			350	360	106.7	109.7	clay, yellow and sand	Clay and sand (or sandstone)	--	--	--	
309	5/5-30E1			360	385	109.7	117.3	clay, yellow	Clay	--	--	--	
309	5/5-30E1			385	395	117.3	120.4	sand and yellow clay	Sand and clay	--	--	--	
309	5/5-30E1			395	400	120.4	121.9	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
309	5/5-30E1			400	450	121.9	137.2	clay, blue and sand	Clay and sand (or sandstone)	--	--	--	
309	5/5-30E1			450	460	137.2	140.2	gravel	Gravel	--	--	--	
309	5/5-30E1			460	475	140.2	144.8	clay, blue, sand and gravel	Clay, sand, and gravel	--	--	--	
309	5/5-30E1			475	488	144.8	148.7	clay, yellow and sand	Clay and sand (or sandstone)	--	--	--	
309	5/5-30E1			488	526	148.7	160.3	clay, blue and sand	Clay and sand (or sandstone)	--	--	--	
309	5/5-30E1			526	538	160.3	164.0	gravel, free	Gravel	--	--	--	
309	5/5-30E1			538	555	164.0	169.2	sand	Sand	--	--	--	
309	5/5-30E1			555	560	169.2	170.7	clay, blue and sand	Clay and sand (or sandstone)	--	--	--	
309	5/5-30E1			560	577	170.7	175.9	tuff, white	Ash or tuff	--	--	--	
309	5/5-30E1			577	579	175.9	176.5	gravel, free	Gravel	--	--	--	
309	5/5-30E1			579	590	176.5	179.8	clay, blue, sand and gravel	Clay, sand, and gravel	--	--	--	
309	5/5-30E1			590	605	179.8	184.4	clay, blue	Clay	--	--	--	
309	5/5-30E1			605	610	184.4	185.9	sand	Sand	--	--	--	
309	5/5-30E1			610	630	185.9	192.0	gravel, free and sand	Sand (or sandstone) and gravel	--	--	--	
309	5/5-30E1			630	636	192.0	193.9	clay, blue and gravel	Clay and gravel	--	--	--	
309	5/5-30E1			636	642	193.9	195.7	gravel, free and sand	Sand (or sandstone) and gravel	--	--	--	
309	5/5-30E1			642	645	195.7	196.6	gravel, cemented	Gravel	cemented	--	--	
309	5/5-30E1			645	650	196.6	198.1	sand	Sand	--	--	--	
309	5/5-30E1			650	655	198.1	199.6	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
309	5/5-30E1			655	675	199.6	205.7	clay, blue	Clay	--	--	--	
309	5/5-30E1			675	685	205.7	208.8	clay, blue and sand	Clay and sand (or sandstone)	--	--	--	
309	5/5-30E1			685	697	208.8	212.4	gravel, free	Gravel	--	--	--	
309	5/5-30E1			697	705	212.4	214.9	clay, blue and sand	Clay and sand (or sandstone)	--	--	--	
309	5/5-30E1			705	710	214.9	216.4	clay, blue	Clay	--	--	--	
309	5/5-30E1			710	725	216.4	221.0	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
309	5/5-30E1			725	730	221.0	222.5	clay, blue	Clay	--	--	--	
309	5/5-30E1			730	740	222.5	225.6	clay, blue, sand and gravel	Clay, sand, and gravel	--	--	--	
309	5/5-30E1			740	743	225.6	226.5	clay, blue	Clay	--	--	--	
309	5/5-30E1			743	755	226.5	230.1	sand and free	Sand	--	--	--	
310	5/5-27H1	310	5/5-27H1	0	20	0.0	6.1	soil	Sand and clay	--	--	--	Qh
310	5/5-27H1			20	50	6.1	15.2	clay, blue, some fine sand	Clay and sand (or sandstone)	--	--	--	
310	5/5-27H1			50	75	15.2	22.9	clay, blue, sticky	Clay	--	--	--	
310	5/5-27H1			75	110	22.9	33.5	clay, blue, some fine sand	Clay and sand (or sandstone)	--	--	--	
310	5/5-27H1			110	115	33.5	35.1	clay, blue, sticky	Clay	--	--	--	
310	5/5-27H1			115	168	35.1	51.2	clay, blue, fine sand, some gravel	Clay and sand (or sandstone)	--	--	--	
310	5/5-27H1			168	235	51.2	71.6	clay, blue, sticky	Clay	--	--	--	
310	5/5-27H1			235	300	71.6	91.4	clay, yellow, sticky	Clay	--	--	--	
310	5/5-27H1			300	310	91.4	94.5	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
310	5/5-27H1			310	360	94.5	109.7	clay, gray	Clay	--	--	--	
310	5/5-27H1			360	370	109.7	112.8	clay, blue	Clay	--	--	--	
310	5/5-27H1			370	380	112.8	115.8	clay, gray	Clay	--	--	--	
310	5/5-27H1			380	423	115.8	128.9	"tule mud," blue	Clay and sand (or sandstone)	--	--	tule	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>	
310	5/5-27H1			423	465	128.9	141.7	sand, blue, and shattered rock	Sand (or sandstone) and gravel	--	--	--		
310	5/5-27H1				465	470	141.7	143.3	clay, red	Clay	--	--	--	
310	5/5-27H1				470	482	143.3	146.9	clay, blue	Clay	--	--	--	
310	5/5-27H1				482	680	146.9	207.3	sand, cemented and gravel	Sand (or sandstone) and gravel	cemented	--	--	
310	5/5-27H1				680	750	207.3	228.6	basalt	Basalt	--	--	--	
311	6/6-9R1	311	6/6-9R1	0	35	0.0	10.7	rock, brown	Ash or tuff	hard	--	--	Tsv QTge	
								clay, yellow, and gravel; water at						
311	6/6-9R1			35	78	10.7	23.8	70 feet	Clay and gravel	--	--	--		
311	6/6-9R1				78	172	23.8	52.4	clay, blue, and gravel	Clay and gravel	--	--	--	
311	6/6-9R1				172	190	52.4	57.9	gravel	Gravel	--	--	--	
311	6/6-9R1				190	193	57.9	58.8	clay, yellow, and gravel	Clay and gravel	--	--	--	
312	6/6-16B1	312	6/6-16B1	0	87	0.0	26.5	clay and rock	Clay and gravel	--	--	--	QTge	
312	6/6-16B1				87	128	26.5	39.0	clay, yellow	Clay	--	--	--	
312	6/6-16B1				128	150	39.0	45.7	clay, blue	Clay	--	--	--	
312	6/6-16B1				150	184	45.7	56.1	clay, yellow	Clay	--	--	--	
312	6/6-16B1				184	240	56.1	73.2	clay, blue	Clay	--	--	--	
312	6/6-16B1				240	317	73.2	96.6	clay, yellow	Clay	--	--	--	
312	6/6-16B1				317	352	96.6	107.3	shale, blue	Clay and sand (or sandstone)	cemented	--	--	
312	6/6-16B1				352	426	107.3	129.8	clay, volcanic red with gravel	Clay and gravel	--	--	--	
313	5/6-25P1	313	5/6-25P1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qoal	
313	5/6-25P1				3	22	0.9	6.7	hardpan	Clay and gravel	hard	--	--	
313	5/6-25P1				22	69	6.7	21.0	clay, yellow	Clay	--	--	--	
313	5/6-25P1				69	156	21.0	47.5	clay, blue	Clay	--	--	--	
313	5/6-25P1				156	168	47.5	51.2	clay, blue and sand	Clay and sand (or sandstone)	--	--	--	
313	5/6-25P1				168	171	51.2	52.1	sand	Sand	--	--	--	
314	5/5-31A1	314	5/5-31A1	0	15	0.0	4.6	not described	No data	--	--	--	Qyal (?)	
314	5/5-31A1				15	17	4.6	5.2	gravel, water	Gravel	--	--	--	
314	5/5-31A1				17	42	5.2	12.8	clay	Clay	--	--	--	
314	5/5-31A1				42	45	12.8	13.7	gravel, water	Gravel	--	--	--	
314	5/5-31A1				45	49	13.7	14.9	rock and clay	Clay and gravel	--	--	--	
314	5/5-31A1				49	60	14.9	18.3	gravel, water	Gravel	--	--	--	
314	5/5-31A1				60	160	18.3	48.8	clay, yellow	Clay	--	--	--	
314	5/5-31A1				160	167	48.8	50.9	clay, some water	Clay	--	--	--	
314	5/5-31A1				167	195	50.9	59.4	clay	Clay	--	--	--	
314	5/5-31A1				195	205	59.4	62.5	quicksand	Sand and clay	--	--	--	
314	5/5-31A1				205	225	62.5	68.6	clay	Clay	--	--	--	
314	5/5-31A1				225	230	68.6	70.1	clay, gravel, some water	Clay and gravel	--	--	--	
314	5/5-31A1				230	352	70.1	107.3	quicksand	Sand and clay	--	--	--	
314	5/5-31A1				352	380	107.3	115.8	clay	Clay	--	--	--	
314	5/5-31A1				380	381	115.8	116.1	sand, flowing water	Sand	--	--	--	
314	5/5-31A1				381	393	116.1	119.8	clay	Clay	--	--	--	
314	5/5-31A1				393	408	119.8	124.4	sand, gravel, water	Sand (or sandstone) and gravel	--	--	--	
315	5/5-31H1	315	5/5-31H1	0	7	0.0	2.1	soil	Sand and clay	--	--	--	Qyal (?)	
315	5/5-31H1				7	48	2.1	14.6	"muck," blue	Clay and sand (or sandstone)	--	--	--	
315	5/5-31H1				48	51	14.6	15.5	sand, salty water, cased off	Sand	--	--	--	
315	5/5-31H1				51	88	15.5	26.8	clay, blue	Clay	--	--	--	
315	5/5-31H1				88	102	26.8	31.1	clay, yellow	Clay	--	--	--	
315	5/5-31H1				102	202	31.1	61.6	clay, blue	Clay	--	--	--	
315	5/5-31H1				202	203	61.6	61.9	gravel	Gravel	--	--	--	
316	4/5-3C1	316	4/5-3C1	0	5	0.0	1.5	boulders	Gravel	--	--	--	Qt Qh	
316	4/5-3C1				5	107	1.5	32.6	clay, yellow	Clay	--	--	--	
316	4/5-3C1				107	110	32.6	33.5	gravel, tuff, water	Gravel	--	--	--	
316	4/5-3C1				110	127	33.5	38.7	clay, gray	Clay	--	--	--	
316	4/5-3C1				127	142	38.7	43.3	clay, blue	Clay	--	--	--	
316	4/5-3C1				142	165	43.3	50.3	clay, gray	Clay	--	--	--	
316	4/5-3C1				165	174	50.3	53.0	clay, glue	Clay	--	--	--	
316	4/5-3C1				174	231	53.0	70.4	clay, gray	Clay	--	--	--	
316	4/5-3C1				231	258	70.4	78.6	blue and gray clay, gravel, water	Clay and gravel	--	--	--	
316	4/5-3C1				258	261	78.6	79.6	clay, yellow	Clay	--	--	--	
317	4/5-14D2	317	4/5-14D2	0	10	0.0	3.0	peat and adobe	Clay and sand (or sandstone)	--	--	peat		

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
317	4/5-14D2			10	48	3.0	14.6	peat and silt	Clay and sand (or sandstone)	--	--	peat	
317	4/5-14D2			48	60	14.6	18.3	silt sandy	Clay and sand (or sandstone)	--	--	--	
317	4/5-14D2			60	75	18.3	22.9	silt, coarse, sandy yellow	Clay and sand (or sandstone)	--	--	--	
317	4/5-14D2			75	105	22.9	32.0	silt	Clay and sand (or sandstone)	--	--	--	
317	4/5-14D2			105	152	32.0	46.3	sand, coarse and silt. yellow	Sand	--	--	--	
317	4/5-14D2			152	156	46.3	47.5	clay, blue	Clay	--	--	--	
317	4/5-14D2			156	200	47.5	61.0	clay, blue and peat in layers	Clay and sand (or sandstone)	--	--	peat	
317	4/5-14D2			200	250	61.0	76.2	clay, blue	Clay	--	--	--	
317	4/5-14D2			250	266	76.2	81.1	silt, sandy	Clay and sand (or sandstone)	--	--	--	
317	4/5-14D2			266	275	81.1	83.8	clay, blue	Clay	--	--	--	
317	4/5-14D2			275	320	83.8	97.5	clay, blue and sand, coarse	Clay and sand (or sandstone)	--	--	--	
317	4/5-14D2			320	330	97.5	100.6	gravel, fine	Gravel	--	--	--	
317	4/5-14D2			330	338	100.6	103.0	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
317	4/5-14D2			338	365	103.0	111.3	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
317	4/5-14D2			365	370	111.3	112.8	clay, sandy, yellow and gravel	Clay, sand, and gravel	--	--	--	
317	4/5-14D2			370	386	112.8	117.7	clay, yellow and silt	Clay and sand (or sandstone)	--	--	--	
317	4/5-14D2			386	398	117.7	121.3	clay, yellow and gravel	Clay and gravel	--	--	--	
317	4/5-14D2			398	420	121.3	128.0	silt, hard or clay, sandy, yellow	Clay and sand (or sandstone)	hard	--	--	
317	4/5-14D2			420	435	128.0	132.6	silt, soft or clay, sandy, yellow	Clay and sand (or sandstone)	--	--	weed	
317	4/5-14D2			435	454	132.6	138.4	silt, hard, yellow	Clay and sand (or sandstone)	hard	--	--	
317	4/5-14D2			454	464	138.4	141.4	gravel and clay	Clay and gravel	--	--	--	
317	4/5-14D2			464	474	141.4	144.5	gravel, fine	Gravel	--	--	--	
317	4/5-14D2			474	509	144.5	155.1	clay and sand	Clay and sand (or sandstone)	--	--	--	
317	4/5-14D2			509	520	155.1	158.5	clay and sand	Clay and sand (or sandstone)	--	--	--	
317	4/5-14D2			520	521	158.5	158.8	gravel	Gravel	--	--	--	
317	4/5-14D2			521	544	158.8	165.8	sand and clay	Sand and clay	--	--	--	
317	4/5-14D2			544	667	165.8	203.3	clay, yellow and tough, sticky gravel, pea size, and sand,	Clay	--	--	--	
317	4/5-14D2			667	683	203.3	208.2	coarse	Sand (or sandstone) and gravel	--	--	--	
317	4/5-14D2			683	710	208.2	216.4	clay, blue, some fine gravel or coarse sand	Clay and gravel	--	--	--	
317	4/5-14D2			710	740	216.4	225.6	clay, blue, sticky	Clay	--	--	--	
317	4/5-14D2							clay, some sand and streaks of gravel	Clay and gravel	--	--	--	
317	4/5-14D2			740	782	225.6	238.4	clay, hard	Clay	hard	--	--	
317	4/5-14D2			782	785	238.4	239.3	clay, blue	Clay	--	--	--	
317	4/5-14D2			785	818	239.3	249.3	clay, hard	Clay	hard	--	--	
317	4/5-14D2			818	819	249.3	249.6	clay, blue, some fine gravel	Clay and gravel	--	--	--	
317	4/5-14D2			819	920	249.6	280.4	clay, yellow, silty, some sand	Clay and sand (or sandstone)	--	--	--	
317	4/5-14D2			920	926	280.4	282.2	clay, alternating yellow and blue with some angular rock fragments	Clay and gravel	--	--	--	
317	4/5-14D2			926	968	282.2	295.0	clay, yellow and blue	Clay	--	--	--	
317	4/5-14D2			968	1090	295.0	332.2	clay, gray, some small sized gravel	Clay	--	--	--	
317	4/5-14D2			1090	1094	332.2	333.5	clay, alternating, blue, gray, yellow	Clay and gravel	--	--	--	
317	4/5-14D2			1094	1221	333.5	372.2	clay, hard	Clay	--	--	--	
317	4/5-14D2			1221	1222	372.2	372.5	clay, blue	Clay	hard	--	--	
317	4/5-14D2			1222	1292	372.5	393.8	clay, gray-green, silty, soft	Clay and sand (or sandstone)	--	--	--	
317	4/5-14D2			1292	1299	393.8	395.9	clay, gray, blue	Clay	--	--	--	
317	4/5-14D2			1299	1365	395.9	416.1	clay, blue, change to rock bit necessary to continue drilling	Clay	--	--	--	
317	4/5-14D2			1365	1370	416.1	417.6	hard zone. necessary to continue drilling	Clay	--	--	--	
317	4/5-14D2			1370	1371	417.6	417.9	soil	Sand (or sandstone) and gravel	hard cemented	--	--	
317	4/5-14D2			1371	1590	417.9	484.6	clay, mostly blue, no gravel	Clay	--	--	--	
317	4/5-14D2			1590	1620	484.6	493.8	clay blue	Sand and clay	--	--	--	
318	4/5-14D1	318	4/5-14D1	0	2	0.0	0.6	clay, blue	Clay	--	--	--	
318	4/5-14D1			2	12	0.6	3.7	clay, blue	Clay	--	--	--	
318	4/5-14D1			12	49	3.7	14.9	gravel	Gravel	--	--	--	
318	4/5-14D1			49	55	14.9	16.8	clay, blue	Clay	--	--	--	
318	4/5-14D1			55	60	16.8	18.3	--	--	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
318	4/5-14D1			60	85	18.3	25.9	clay, yellow	Clay	--	--	--	
318	4/5-14D1			85	90	25.9	27.4	clay, yellow, and gravel	Clay and gravel	--	--	--	
318	4/5-14D1			90	106	27.4	32.3	clay, blue	Clay	--	--	--	
318	4/5-14D1			106	115	32.3	35.1	clay, blue, and gravel	Clay and gravel	--	--	--	
318	4/5-14D1			115	185	35.1	56.4	clay, blue	Clay	--	--	--	
318	4/5-14D1			185	208	56.4	63.4	clay, yellow	Clay	--	--	--	
318	4/5-14D1			208	220	63.4	67.1	clay, blue	Clay	--	--	--	
318	4/5-14D1			220	245	67.1	74.7	clay, blue and gravel	Clay and gravel	--	--	--	
318	4/5-14D1			245	271	74.7	82.6	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
318	4/5-14D1			271	300	82.6	91.4	clay, blue	Clay	--	--	--	
318	4/5-14D1			300	324	91.4	98.8	clay, blue, and gravel	Clay and gravel	--	--	--	
318	4/5-14D1			324	412	98.8	125.6	clay, yellow	Clay	--	--	--	
318	4/5-14D1			412	495	125.6	150.9	clay, yellow, sandy	Clay and sand (or sandstone)	--	--	--	
318	4/5-14D1			495	502	150.9	153.0	clay, yellow, sandy, and gravel	Clay, sand, and gravel	--	--	--	
318	4/5-14D1			502	512	153.0	156.1	yellow sand and gravel	Sand (or sandstone) and gravel	--	--	--	
318	4/5-14D1			512	535	156.1	163.1	yellow sand and gravel	Sand (or sandstone) and gravel	--	--	--	
318	4/5-14D1			535	537	163.1	163.7	yellow cement and gravel	Clay, sand, and gravel	cemented	--	--	
318	4/5-14D1			537	540	163.7	164.6	clay, yellow, and gravel	Clay and gravel	--	--	--	
319	4/5-14L1	319	4/5-14L1	0	58	0.0	17.7	dark "surface" mud and peat	Clay and sand (or sandstone)	--	--	peat	
319	4/5-14L1			58	66	17.7	20.1	clay, tough light blue	Clay	--	--	--	
319	4/5-14L1			66	86	20.1	26.2	clay, tough brownish-yellow	Clay	--	--	--	
319	4/5-14L1			86	100	26.2	30.5	clay, tough light blue	Clay	--	--	--	
319	4/5-14L1			100	135	30.5	41.1	clay, soft dark blue	Clay	--	--	--	
319	4/5-14L1			135	151	41.1	46.0	blue "tule bed"	Clay and sand (or sandstone)	--	--	tule	
319	4/5-14L1			151	166	46.0	50.6	clay blue	Clay	--	--	--	
319	4/5-14L1			166	170	50.6	51.8	black "tule bed"	Clay and sand (or sandstone)	--	--	tule	
319	4/5-14L1			170	175	51.8	53.3	clay, clay	Clay	--	--	--	
319	4/5-14L1			175	179	53.3	54.6	sandy blue clay with small gravel	Clay, sand, and gravel	--	--	--	
319	4/5-14L1			179	202	54.6	61.6	clay, blue	Clay	--	--	--	
319	4/5-14L1			202	207	61.6	63.1	blue clay with small gravel	Clay and gravel	--	--	--	
319	4/5-14L1			207	221	63.1	67.4	clay, brown	Clay	--	--	--	
319	4/5-14L1			221	244	67.4	74.4	clay, blue	Clay	--	--	--	
319	4/5-14L1			244	246	74.4	75.0	black "tule bed"	Clay and sand (or sandstone)	--	--	tule	
319	4/5-14L1			246	250	75.0	76.2	gray and blue clay with gravel	Clay and gravel	--	--	--	
319	4/5-14L1			250	252	76.2	76.8	sandy blue clay	Clay and sand (or sandstone)	--	--	--	
319	4/5-14L1			252	255	76.8	77.7	coarse blue and gray gravel and rocks	Clay and sand (or sandstone)	--	--	--	
319	4/5-14L1			255	285	77.7	86.9	blue clay with streaks of sand	Gravel	--	--	--	
319	4/5-14L1			285	298	86.9	90.8	silty mud and "weed"	Clay and sand (or sandstone)	--	--	--	
319	4/5-14L1			298	300	90.8	91.4	dark sticky clay	Clay	--	--	--	
319	4/5-14L1			300	316	91.4	96.3	sand, silt, soft blue clay	Sand and clay	--	--	--	
319	4/5-14L1			316	327	96.3	99.7	black tough mud and tule	Clay and sand (or sandstone)	--	--	tule	
319	4/5-14L1			327	364	99.7	110.9	clay, blue, sand streaks	Clay and sand (or sandstone)	--	--	--	
319	4/5-14L1			364	371	110.9	113.1	hard blue clay with embedded boulders	Clay and gravel	hard	--	--	
319	4/5-14L1			371	385	113.1	117.3	clay, blue	Clay	--	--	--	
319	4/5-14L1			385	451	117.3	137.5	clay, brown, and rocks	Clay and gravel	--	--	--	
319	4/5-14L1			451	466	137.5	142.0	tough dark gray blue clay	Clay	hard	--	--	
319	4/5-14L1			466	490	142.0	149.4	clay, brownish-yellow	Clay	--	--	--	
319	4/5-14L1			490	527	149.4	160.6	shale, gray	Clay and sand (or sandstone)	cemented	--	--	
319	4/5-14L1			527	565	160.6	172.2	clay, brownish-yellow, slightly sandy	Clay and sand (or sandstone)	--	--	--	
319	4/5-14L1			565	595	172.2	181.4	gray sticky clay	Clay	--	--	--	
319	4/5-14L1			595	610	181.4	185.9	gray sticky clay	Clay	--	--	--	
319	4/5-14L1			610	645	185.9	196.6	gravel and sand	Sand (or sandstone) and gravel	--	--	--	
319	4/5-14L1			645	660	196.6	201.2	clay, yellow	Clay	--	--	--	
320	9/7-26C1	320	9/7-26C1	0	5	0.0	1.5	surface	Sand and clay	--	--	--	
320	9/7-26C1			5	60	1.5	18.3	clay, yellow and boulders	Clay and gravel	--	--	--	
320	9/7-26C1			60	85	18.3	25.9	tuff	Ash or tuff	--	--	--	Tsv
320	9/7-26C1			85	150	25.9	45.7	lava ash	Basalt	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
320	9/7-26C1			150	180	45.7	54.9	lava rock, gray	Basalt	hard	--	--	
320	9/7-26C1			180	220	54.9	67.1	basalt	Basalt	--	--	--	
320	9/7-26C1			220	275	67.1	83.8	tuff	Ash or tuff	--	--	--	
320	9/7-26C1			275	310	83.8	94.5	shale, hard, brown	Clay and sand (or sandstone)	hard	--	--	
320	9/7-26C1			310	340	94.5	103.6	tuff	Ash or tuff	--	--	--	
320	9/7-26C1			340	365	103.6	111.3	basalt	Basalt	--	--	--	
320	9/7-26C1			365	385	111.3	117.3	lava ash	Basalt	--	--	--	
320	9/7-26C1			385	450	117.3	137.2	tuff	Ash or tuff	--	--	--	
321	9/7-26G1	321	9/7-26G1	0	5	0.0	1.5	surface	Sand and clay	--	--	--	Slope wash
321	9/7-26G1			5	15	1.5	4.6	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
321	9/7-26G1			15	30	4.6	9.1	boulders	Gravel	--	--	--	
321	9/7-26G1			30	40	9.1	12.2	basalt, hard	Basalt	hard	--	--	Tsv
321	9/7-26G1			40	55	12.2	16.8	basalt, medium soft	Basalt	--	--	--	
321	9/7-26G1			55	305	16.8	93.0	tuff	Ash or tuff	--	--	--	
322	8/6-14R1	322	8/6-14R1	0	15	0.0	4.6	soil	Sand and clay	--	--	--	Qyal
322	8/6-14R1			15	25	4.6	7.6	gravel and boulders	Gravel	--	--	--	
322	8/6-14R1			25	73	7.6	22.3	tuff, yellow	Ash or tuff	--	--	--	Tsv
322	8/6-14R1			73	97	22.3	29.6	tuff, gray	Ash or tuff	--	--	--	
322	8/6-14R1			97	107	29.6	32.6	rock, boulders, sand	Sand (or sandstone) and gravel	hard	--	--	
322	8/6-14R1			107	123	32.6	37.5	rock, boulders, sand, clay, yellow	Clay, sand, and gravel	hard	--	--	
322	8/6-14R1			123	132	37.5	40.2	gravel and sand, fine	Sand (or sandstone) and gravel	--	--	--	
323	8/6-23M1	323	8/6-23M1	0	4	0.0	1.2	soil and boulders	Clay, sand, and gravel	--	--	--	Qyal and Qoal
323	8/6-23M1			4	55	1.2	16.8	"hardpan" and boulders	Clay and gravel	hard	--	--	
323	8/6-23M1			55	57	16.8	17.4	gravel, water	Gravel	--	--	--	
323	8/6-23M1			57	97	17.4	29.6	clay and boulders	Clay and gravel	--	--	--	
323	8/6-23M1			97	100	29.6	30.5	gravel, water	Gravel	--	--	--	
323	8/6-23M1			100	129	30.5	39.3	clay and boulders, blue	Clay and gravel	--	--	--	
324	7/5-15A1	324	7/5-15A1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Qyal and Qoal
324	7/5-15A1			4	6	1.2	1.8	clay, sandy	Clay and sand (or sandstone)	--	--	--	
324	7/5-15A1							clay, boulders; some water at 15 ft.					
324	7/5-15A1			6	32	1.8	9.8	Clay and gravel	--	--	--	--	
324	7/5-15A1			32	40	9.8	12.2	boulders and clay; some water	Clay and gravel	--	--	--	
324	7/5-15A1			40	95	12.2	29.0	clay and boulders	Clay and gravel	--	--	--	
324	7/5-15A1			95	105	29.0	32.0	boulders; some water	Gravel	--	--	--	
324	7/5-15A1			105	355	32.0	108.2	boulders and clay	Clay and gravel	--	--	--	
325	7/5-14G1	325	7/5-14G1	0	5	0.0	1.5	surface	Sand and clay	--	--	--	Qoal and Qyal
325	7/5-14G1			5	20	1.5	6.1	clay, yellow	Clay	--	--	--	
325	7/5-14G1			20	50	6.1	15.2	clay and some boulders, yellow	Clay and gravel	--	--	--	
325	7/5-14G1			50	65	15.2	19.8	gravel, free	Gravel	--	--	--	
325	7/5-14G1			65	227	19.8	69.2	clay, sand, and gravel, yellow	Clay, sand, and gravel	--	--	--	
325	7/5-14G1			227	232	69.2	70.7	gravel, free	Gravel	--	--	--	
325	7/5-14G1			232	255	70.7	77.7	volcanic rock	Ash or tuff	--	--	--	Tsv
325	7/5-14G1			255	265	77.7	80.8	Ash or tuff	Ash or tuff	--	--	--	
326	7/5-16L1	326	7/5-16L1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Qyal and Qoal
326	7/5-16L1			4	20	1.2	6.1	soil and boulders	Clay, sand, and gravel	--	--	--	
326	7/5-16L1			20	57	6.1	17.4	clay, yellow; and boulders	Clay and gravel	--	--	--	
326	7/5-16L1			57	70	17.4	21.3	clay, yellow	Clay	--	--	--	
326	7/5-16L1			70	71	21.3	21.6	gravel and small amount of water	Gravel	--	--	--	
326	7/5-16L1			71	120	21.6	36.6	clay and boulders	Clay and gravel	--	--	--	
326	7/5-16L1			120	121	36.6	36.9	gravel and water	Gravel	--	--	--	
326	7/5-16L1			121	218	36.9	66.4	clay and boulders	Clay and gravel	--	--	--	
326	7/5-16L1			218	220	66.4	67.1	gravel and water	Gravel	--	--	--	
326	7/5-16L1			220	221	67.1	67.4	blue cement and gravel	Clay and gravel	cemented	--	--	
327	7/5-17J1	327	7/5-17J1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Tsv
327	7/5-17J1			4	55	1.2	16.8	clay, yellow; and broken rock	Clay and gravel	--	--	--	
327	7/5-17J1			55	70	16.8	21.3	rock, broken, water	Ash or tuff	hard	--	--	
327	7/5-17J1			70	86	21.3	26.2	basalt	Basalt	--	--	--	
327	7/5-17J1			86	130	26.2	39.6	basalt, broken; water	Basalt	--	--	--	
327	7/5-17J1			130	190	39.6	57.9	sandstone	Sandstone	cemented	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
327	7/5-17J1			190	250	57.9	76.2	basalt	Basalt	--	--	--	
327	7/5-17J1			250	340	76.2	103.6	sandstone, hard	Sandstone	cemented	--	--	
327	7/5-17J1			340	430	103.6	131.1	basalt	Basalt	--	--	--	
327	7/5-17J1			430	470	131.1	143.3	sandstone	Sandstone	cemented	--	--	
327	7/5-17J1			470	480	143.3	146.3	shale and broken rock	Clay, sand, and gravel	cemented	--	--	
327	7/5-17J1			480	534	146.3	162.8	sandstone	Sandstone	cemented	--	--	
327	7/5-17J1			534	537	162.8	163.7	sand, gravel and water	Sand (or sandstone) and gravel	--	--	--	
327	7/5-17J1			537	564	163.7	171.9	sandstone	Sandstone	cemented	--	--	
328	7/5-16N1	328	7/5-16N1	0	6	0.0	1.8	soil	Sand and clay	--	--	--	Qyal and Qoal
328	7/5-16N1			6	35	1.8	10.7	clay	Clay	--	--	--	
328	7/5-16N1			35	40	10.7	12.2	clay and gravel, water	Clay and gravel	--	--	--	
328	7/5-16N1			40	140	12.2	42.7	clay and boulders	Clay and gravel	--	--	--	
328	7/5-16N1			140	150	42.7	45.7	clay and gravel, water	Clay and gravel	--	--	--	
328	7/5-16N1			150	213	45.7	64.9	clay	Clay	--	--	--	
328	7/5-16N1			213	218	64.9	66.4	clay and gravel, blue, water	Clay and gravel	--	--	--	
328	7/5-16N1			218	225	66.4	68.6	clay, blue	Clay	--	--	--	
328	7/5-16N1			225	252	68.6	76.8	clay and gravel, blue, water	Clay and gravel	--	--	--	
329	7/5-23L1	329	7/5-23L1	0	20	0.0	6.1	soil	Sand and clay	--	--	--	Qyal and Qoal
329	7/5-23L1			20	35	6.1	10.7	clay, yellow	Clay	--	--	--	
329	7/5-23L1			35	37	10.7	11.3	clay, yellow; sand and gravel	Clay, sand, and gravel	--	--	--	
329	7/5-23L1			37	50	11.3	15.2	clay, sandy, yellow; and gravel	Clay, sand, and gravel	--	--	--	
329	7/5-23L1			50	59	15.2	18.0	sand and gravel, blue	Sand (or sandstone) and gravel	--	--	--	
329	7/5-23L1			59	77	18.0	23.5	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
329	7/5-23L1			77	83	23.5	25.3	clay, sandy, blue and gravel	Clay, sand, and gravel	--	--	--	
329	7/5-23L1			83	89	25.3	27.1	gravel	Gravel	--	--	--	
329	7/5-23L1			89	100	27.1	30.5	clay, blue	Clay	--	--	--	
329	7/5-23L1			100	127	30.5	38.7	clay, yellow and gravel	Clay and gravel	--	--	--	
329	7/5-23L1			127	132	38.7	40.2	clay, yellow	Clay	--	--	--	
329	7/5-23L1			132	134	40.2	40.8	clay, blue	Clay	--	--	--	
329	7/5-23L1			134	150	40.8	45.7	clay, yellow and gravel	Clay and gravel	--	--	--	
330	7/5-27D1	330	7/5-27D1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qyal and Qoal
330	7/5-27D1			3	30	0.9	9.1	clay	Clay	--	--	--	
330	7/5-27D1			30	40	9.1	12.2	gravel, water	Gravel	--	--	--	
330	7/5-27D1			40	100	12.2	30.5	clay	Clay	--	--	--	
330	7/5-27D1			100	190	30.5	57.9	clay, gravel seams; some water	Clay and gravel	--	--	--	
330	7/5-27D1			190	260	57.9	79.2	clay, yellow	Clay	--	--	--	
330	7/5-27D1			260	263	79.2	80.2	mud, white; some water	Clay and sand (or sandstone)	--	--	--	Tsv
330	7/5-27D1			263	285	80.2	86.9	clay, white	Clay	--	--	--	
330	7/5-27D1			285	295	86.9	89.9	clay, brownish-gray	Clay	--	--	--	
330	7/5-27D1			295	321	89.9	97.8	clay, white	Clay	--	--	--	
330	7/5-27D1			321	335	97.8	102.1	clay, brown	Clay	--	--	--	
330	7/5-27D1			335	345	102.1	105.2	rock, red soft; some water	Ash or tuff	hard	--	--	
330	7/5-27D1			345	360	105.2	109.7	rock, red, hard	Ash or tuff	hard	--	--	
330	7/5-27D1			360	410	109.7	125.0	sandstone	Sandstone	cemented	--	--	
331	7/4-30L1	331	7/4-30L1	0	21	0.0	6.4	soil and boulders	Clay, sand, and gravel	--	--	--	Qyal
331	7/4-30L1			21	22	6.4	6.7	water	Clay, sand, and gravel	--	--	--	
331	7/4-30L1			22	40	6.7	12.2	cement and boulders	Clay, sand, and gravel	cemented	--	--	
331	7/4-30L1			40	60	12.2	18.3	tuff, gray	Ash or tuff	--	--	--	Tsv
331	7/4-30L1			60	140	18.3	42.7	tuff, brown	Ash or tuff	--	--	--	
331	7/4-30L1			140	168	42.7	51.2	tuff, green	Ash or tuff	--	--	--	
331	7/4-30L1			168	171	51.2	52.1	tuff, gray and water	Ash or tuff	--	--	--	
332	7/4-31E1	332	7/4-31E1	0	7	0.0	2.1	soil	Sand and clay	--	--	--	Qyal and Qoal
332	7/4-31E1			7	40	2.1	12.2	clay	Clay	--	--	--	
332	7/4-31E1			40	65	12.2	19.8	gravel	Gravel	--	--	--	
332	7/4-31E1			65	109	19.8	33.2	clay	Clay	--	--	--	
332	7/4-31E1			109	140	33.2	42.7	clay and boulders	Clay and gravel	--	--	--	
332	7/4-31E1			140	242	42.7	73.8	clay	Clay	--	--	--	
332	7/4-31E1			242	272	73.8	82.9	gravel, small	Gravel	--	--	--	
333	7/5-36N1	333	7/5-36N1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qoal
333	7/5-36N1			3	12	0.9	3.7	clay, brown	Clay	--	--	--	
333	7/5-36N1			12	20	3.7	6.1	clay, hard	Clay	hard	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
333	7/5-36N1			20	26	6.1	7.9	gravel, water	Gravel	--	--	--	
333	7/5-36N1			26	34	7.9	10.4	clay, hard	Clay	hard	--	--	
333	7/5-36N1			34	48	10.4	14.6	clay, white	Clay	--	--	--	Tsv
333	7/5-36N1			48	97	14.6	29.6	tuff, brown and gravel	Ash or tuff	--	--	--	
333	7/5-36N1			97	103	29.6	31.4	gravel, water	Gravel	--	--	--	
333	7/5-36N1			103	104	31.4	31.7	tuff	Ash or tuff	--	--	--	
334	6/5-1C3	334	6/5-1C3	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qoal
334	6/5-1C3			3	42	0.9	12.8	clay, boulders, yellow	Clay and gravel	--	--	--	
334	6/5-1C3			42	45	12.8	13.7	water	Clay and gravel	--	--	--	
334	6/5-1C3			45	81	13.7	24.7	clay, yellow	Clay	--	--	--	
334	6/5-1C3			81	90	24.7	27.4	blue	Clay	--	--	--	
334	6/5-1C3			90	92	27.4	28.0	water	Clay	--	--	--	
334	6/5-1C3			92	125	28.0	38.1	clay, yellow	Clay	--	--	--	
335	6/4-5A1	335	6/4-5A1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Qyal and Qoal
335	6/4-5A1			4	18	1.2	5.5	hardpan and clay	Clay and gravel	hard	--	--	
335	6/4-5A1			18	59	5.5	18.0	boulders, gravel, sand; and some clay	Clay, sand, and gravel	--	--	--	
335	6/4-5A1			59	81	18.0	24.7	clay	Clay	--	--	--	
335	6/4-5A1			81	89	24.7	27.1	gravel, boulders and clay	Sand (or sandstone) and gravel	--	--	--	
335	6/4-5A1			89	99	27.1	30.2	boulders and clay	Clay and gravel	--	--	--	
335	6/4-5A1			99	125	30.2	38.1	hard, sand and gravel	Sand (or sandstone) and gravel	hard	--	--	
335	6/4-5A1			125	138	38.1	42.1	cemented conglomerate	Clay, sand, and gravel	--	--	--	
335	6/4-5A1			138	319	42.1	97.2	rock	Undifferentiated basement	hard	--	--	KJu
336	6/4-5B1	336	6/4-5B1	0	10	0.0	3.0	soil	Sand and clay	--	--	--	Qyal and Qoal
336	6/4-5B1			10	13	3.0	4.0	clay	Clay	--	--	--	
336	6/4-5B1			13	54	4.0	16.5	hardpan and clay	Clay and gravel	hard	--	--	
336	6/4-5B1			54	58	16.5	17.7	rock	Undifferentiated basement	hard	--	--	KJu
337	6/4-5B2	337	6/4-5B2	0	12	0.0	3.7	soil	Sand and clay	--	--	--	Qyal
337	6/4-5B2			12	18	3.7	5.5	clay	Clay	--	--	--	
337	6/4-5B2			18	28.4	5.5	8.7	rock	Undifferentiated basement	hard	--	--	KJu
338	6/4-4E1	338	6/4-4E1	0	5	0.0	1.5	surface	Sand and clay	--	--	--	Qyal
338	6/4-4E1			5	65	1.5	19.8	clay, yellow and boulders	Clay and gravel	--	--	--	
338	6/4-4E1			65	115	19.8	35.1	granite gray	Gravel	--	--	--	Tsv
338	6/4-4E1			115	155	35.1	47.2	tuff	Ash or tuff	--	--	--	
338	6/4-4E1			155	210	47.2	64.0	granite, gray	Ash or tuff	--	--	--	
338	6/4-4E1			210	427	64.0	130.1	tuff	Ash or tuff	--	--	--	
338	6/4-4E1			427	450	130.1	137.2	volcanic ash	Ash or tuff	--	--	--	
338	6/4-4E1			450	455	137.2	138.7	tuff	Ash or tuff	--	--	--	
338	6/4-4E1			455	460	138.7	140.2	volcanic	Ash or tuff	--	--	--	
338	6/4-4E1	338	6/4-4E1	460	463	140.2	141.1	volcanic rock, gray	Ash or tuff	--	--	--	
338	6/4-4E1			463	475	141.1	144.8	volcanic rock, black	Ash or tuff	--	--	--	
338	6/4-4E1			475	478	144.8	145.7	volcanic rock, gray	Ash or tuff	--	--	--	
338	6/4-4E1			478	600	145.7	182.9	shale rock, black	Clay and sand (or sandstone)	cemented	--	--	
339	6/4-5J1	339	6/4-5J1	0	25	0.0	7.6	soil	Sand and clay	--	--	--	Qyal and Qoal
339	6/4-5J1			25	42	7.6	12.8	gravel and clay	Clay and gravel	--	--	--	
339	6/4-5J1			42	64	12.8	19.5	clay, gravel; and boulders	Clay and gravel	--	--	--	
339	6/4-5J1			64	76	19.5	23.2	gravel, hard	Gravel	hard	--	--	
339	6/4-5J1			76	78	23.2	23.8	clay and boulders	Clay and gravel	--	--	--	
339	6/4-5J1			78	80	23.8	24.4	clay	Clay	--	--	--	
339	6/4-5J1			80	82	24.4	25.0	clay and boulders	Clay and gravel	--	--	--	
339	6/4-5J1			82	89	25.0	27.1	gravel	Gravel	--	--	--	
339	6/4-5J1			89	94	27.1	28.7	clay	Clay	--	--	--	
339	6/4-5J1	339	6/4-5J1	94	96	28.7	29.3	clay and boulders	Clay and gravel	--	--	--	
339	6/4-5J1			96	120	29.3	36.6	clay and gravel	Clay and gravel	--	--	--	
339	6/4-5J1			120	122	36.6	37.2	boulders	Gravel	--	--	--	
339	6/4-5J1			122	128	37.2	39.0	clay, soft	Clay	--	--	--	
339	6/4-5J1			128	160	39.0	48.8	clay, soft	Clay	--	--	--	
339	6/4-5J1			160	178	48.8	54.3	clay, tough	Clay	--	--	--	
339	6/4-5J1			178	182	54.3	55.5	gravel, good	Gravel	--	--	--	
339	6/4-5J1			182	186	55.5	56.7	clay	Clay	--	--	--	
339	6/4-5J1			186	192	56.7	58.5	gravel, good	Gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>	
339	6/4-5J1			192	211	58.5	64.3	clay and gravel	Clay and gravel	--	--	--		
339	6/4-5J1			211	292	64.3	89.0	rock	Undifferentiated basement	hard	--	--	KJu	
340	6/4-6R1	340	6/4-6R1	0	18	0.0	5.5	adobe soil	Sand and clay	--	--	--	Qyal	
340	6/4-6R1			18	32	5.5	9.8	clay, yellow	Clay	--	--	--		
340	6/4-6R1			32	36	9.8	11.0	sand and clay	Sand and clay	--	--	--		
340	6/4-6R1			36	43	11.0	13.1	sand and gravel	Sand (or sandstone) and gravel	--	--	--		
340	6/4-6R1			43	45	13.1	13.7	clay, yellow	Clay	--	--	--		
340	6/4-6R1			45	48	13.7	14.6	sand rock	Sandstone	cemented	--	--	Qaal (?)	
340	6/4-6R1			48	50	14.6	15.2	yellow clay	Clay	--	--	--		
340	6/4-6R1			50	51	15.2	15.5	rock	Sandstone	hard	--	--		
340	6/4-6R1			51	75	15.5	22.9	clay, blue	Clay	--	--	--		
340	6/4-6R1			75	83	22.9	25.3	sand and gravel	Sand (or sandstone) and gravel	--	--	--		
340	6/4-6R1							sand, cemented; gravel and clay mixture with soft streaks						
340	6/4-6R1			83	162	25.3	49.4		Sand (or sandstone) and gravel	cemented	--	--		
340	6/4-6R1			162	181	49.4	55.2	sand, cemented; and boulders	Sand (or sandstone) and gravel	cemented	--	--		
340	6/4-6R1			181	189	55.2	57.6	clay, sandy	Clay and sand (or sandstone)	--	--	--		
340	6/4-6R1			189	233	57.6	71.0	hardpan and boulders	Clay and gravel	hard	--	--		
340	6/4-6R1			233	242	71.0	73.8	rocks	Gravel	hard	--	--	Tsv	
341	6/4-6R2	341	6/4-6R2	0	15	0.0	4.6	surface	Sand and clay	--	--	--	Qyal and Qaal	
341	6/4-6R2			15	38	4.6	11.6	clay, yellow	Clay	--	--	--		
341	6/4-6R2			38	50	11.6	15.2	gravel	Gravel	--	--	--		
341	6/4-6R2			50	65	15.2	19.8	clay, blue	Clay	--	--	--		
341	6/4-6R2			65	80	19.8	24.4	clay, blue and gravel	Clay and gravel	--	--	--		
341	6/4-6R2			80	105	24.4	32.0	clay, yellow and gravel	Clay and gravel	--	--	--		
341	6/4-6R2			105	109	32.0	33.2	gravel	Gravel	--	--	--		
341	6/4-6R2			109	126	33.2	38.4	clay, yellow and gravel	Clay and gravel	--	--	--		
341	6/4-6R2			126	131	38.4	39.9	gravel	Gravel	--	--	--		
341	6/4-6R2			131	136	39.9	41.5	clay, yellow and gravel	Clay and gravel	--	--	--		
341	6/4-6R2			136	148	41.5	45.1	clay, blue	Clay	--	--	--		
341	6/4-6R2			148	156	45.1	47.5	clay, blue and gravel	Clay and gravel	--	--	--		
341	6/4-6R2			156	165	47.5	50.3	clay, yellow and gravel	Clay and gravel	--	--	--		
341	6/4-6R2			165	205	50.3	62.5	clay, yellow and boulders	Clay and gravel	--	--	--		
341	6/4-6R2			205	210	62.5	64.0	gravel and boulders	Gravel	--	--	--		
341	6/4-6R2			210	216	64.0	65.8	boulders	Gravel	--	--	--		
341	6/4-6R2			216	220	65.8	67.1	rocks, solid white, very hard	Ash or tuff	hard	--	--	Tsv	
342	6/4-6P1	342	6/4-6P1	0	15	0.0	4.6	topsoil	Sand and clay	--	--	--	Qyal and Qaal	
342	6/4-6P1			15	17	4.6	5.2	sand	Sand	--	--	--		
342	6/4-6P1			17	31	5.2	9.4	gravel	Gravel	--	--	--		
342	6/4-6P1			31	37	9.4	11.3	clay, yellow	Clay	--	--	--		
342	6/4-6P1			37	46	11.3	14.0	gravel	Gravel	--	--	--		
342	6/4-6P1			46	54	14.0	16.5	sand	Sand	--	--	--		
342	6/4-6P1			54	62	16.5	18.9	clay, blue	Clay	--	--	--		
342	6/4-6P1			62	72	18.9	21.9	clay, sandy	Clay and sand (or sandstone)	--	--	--		
342	6/4-6P1			72	78	21.9	23.8	gravel, fine	Gravel	--	--	--		
342	6/4-6P1			78	93	23.8	28.3	clay blue	Clay	--	--	--		
342	6/4-6P1			93	110	28.3	33.5	gravel, fine	Gravel	--	--	--		
342	6/4-6P1			110	120	33.5	36.6	clay brown	Clay	--	--	--		
343	6/4-5Q1	343	6/4-5Q1	0	12	0.0	3.7	soil	Sand and clay	--	--	--	Qyal and Qaal	
343	6/4-5Q1			12	31	3.7	9.4	clay, yellow	Clay	--	--	--		
343	6/4-5Q1			31	49	9.4	14.9	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--		
343	6/4-5Q1			49	54	14.9	16.5	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--		
343	6/4-5Q1			54	70	16.5	21.3	clay, blue, tough	Clay	--	--	--		
343	6/4-5Q1			70	73	21.3	22.3	sand, blue; and clay	Sand and clay	--	--	--		
343	6/4-5Q1			73	77	22.3	23.5	clay, yellow, tough	Clay	--	--	--		
343	6/4-5Q1			77	107	23.5	32.6	clay mixtures	Sand (or sandstone) and gravel	--	--	--		
343	6/4-5Q1			107	112	32.6	34.1	sand, gravel, and boulders, and	Sand (or sandstone) and gravel	--	--	--		
343	6/4-5Q1			112	145	34.1	44.2	clay mixtures	Clay, sand, and gravel	--	--	--		
343	6/4-5Q1			145	151	44.2	46.0	sandy clay and gravels	Sand (or sandstone) and gravel	--	--	--		
343	6/4-5Q1			151	154	46.0	46.9	sand and gravel	Gravel	--	--	--		

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
343	6/4-5Q1			154	166	46.9	50.6	sand clay and gravel	Clay, sand, and gravel	--	--	--	
343	6/4-5Q1			166	167	50.6	50.9	rock	Undifferentiated basement	hard	--	--	KJu
344	6/4-17A1	344	6/4-17A1	0	10	0.0	3.0	surface	Sand and clay	--	--	--	Qyal and Qoal
344	6/4-17A1			10	70	3.0	21.3	clay, yellow, and gravel	Clay and gravel	--	--	--	
344	6/4-17A1			70	120	21.3	36.6	boulders and gravel	Gravel	--	--	--	
344	6/4-17A1			120	180	36.6	54.9	clay, yellow	Clay	--	--	--	
344	6/4-17A1			180	200	54.9	61.0	gravel	Gravel	--	--	--	
344	6/4-17A1			200	225	61.0	68.6	boulders and gravel	Gravel	--	--	--	
344	6/4-17A1			225	250	68.6	76.2	clay, yellow	Clay	--	--	--	
345	6/4-18A3	345	6/4-18A3	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qyal
345	6/4-18A3			3	15	0.9	4.6	clay	Clay	--	--	--	
345	6/4-18A3			15	25	4.6	7.6	gravel and sand	Sand (or sandstone) and gravel	--	--	--	
345	6/4-18A3			25	40	7.6	12.2	clay	Clay	--	--	--	
345	6/4-18A3			40	43	12.2	13.1	gravel	Gravel	--	--	--	
345	6/4-18A3			43	82	13.1	25.0	clay	Clay	--	--	--	
345	6/4-18A3			82	98	25.0	29.9	gravel and boulders, loose	Gravel	--	--	--	
345	6/4-18A3			98	140	29.9	42.7	clay	Clay	--	--	--	
345	6/4-18A3			140	158	42.7	48.2	gravel and boulders, fairly loose	Gravel	--	--	--	
345	6/4-18A3			158	172	48.2	52.4	clay	Clay	--	--	--	
345	6/4-18A3			172	204	52.4	62.2	boulders and gravel	Gravel	--	--	--	
345	6/4-18A3			204	240	62.2	73.2	clay and boulders	Clay and gravel	--	--	--	
345	6/4-18A3			240	248	73.2	75.6	gravel	Gravel	--	--	--	
345	6/4-18A3			248	288	75.6	87.8	clay and boulders, tight	Clay and gravel	--	--	--	
345	6/4-18A3			288	304	87.8	92.7	gravel, fairly loose	Gravel	--	--	--	
345	6/4-18A3			304	320	92.7	97.5	rock	Ash or tuff	hard	--	--	
345	6/4-18A3			320	328	97.5	100.0	clay, sticky and tight	Clay	--	--	--	
345	6/4-18A3			328	335	100.0	102.1	rock	Ash or tuff	hard	--	--	
345	6/4-18A3			335	340	102.1	103.6	mud, blue	Clay and sand (or sandstone)	--	--	--	
345	6/4-18A3			340	354	103.6	107.9	gravel and boulders	Gravel	--	--	--	
345	6/4-18A3			354	381	107.9	116.1	clay and boulders	Clay and gravel	--	--	--	
345	6/4-18A3			381	395	116.1	120.4	rock	Ash or tuff	hard	--	--	
345	6/4-18A3			395	408	120.4	124.4	gravel	Gravel	--	--	--	
345	6/4-18A3			408	414	124.4	126.2	rock	Ash or tuff	hard	--	--	
345	6/4-18A3			414	422	126.2	128.6	gravel	Gravel	--	--	--	
345	6/4-18A3			422	434	128.6	132.3	rock	Ash or tuff	hard	--	--	
345	6/4-18A3			434	442	132.3	134.7	clay	Clay	--	--	--	
345	6/4-18A3			442	458	134.7	139.6	rock	Ash or tuff	hard	--	--	
345	6/4-18A3			458	479	139.6	146.0	gravel and boulders	Gravel	--	--	--	
345	6/4-18A3			479	520	146.0	158.5	clay and boulders	Clay and gravel	--	--	--	
345	6/4-18A3			520	525	158.5	160.0	gravel	Gravel	--	--	--	
345	6/4-18A3			525	545	160.0	166.1	rock	Ash or tuff	hard	--	--	
345	6/4-18A3			545	565	166.1	172.2	clay	Clay	--	--	--	
345	6/4-18A3			565	605	172.2	184.4	boulders and clay	Clay and gravel	--	--	--	
345	6/4-18A3			605	620	184.4	189.0	gravel and clay	Clay and gravel	--	--	--	
345	6/4-18A3			620	630	189.0	192.0	rock	Ash or tuff	hard	--	--	
345	6/4-18A3			630	650	192.0	198.1	clay	Clay	--	--	--	
345	6/4-18A3			650	694	198.1	211.5	boulders and clay	Clay and gravel	--	--	--	
345	6/4-18A3			694	702	211.5	214.0	rock	Ash or tuff	hard	--	--	
345	6/4-18A3			702	730	214.0	222.5	clay and boulders	Clay and gravel	--	--	--	
345	6/4-18A3			730	730	222.5	222.5	rock	Ash or tuff	hard	--	--	
346	6/4-15Q1	346	6/4-15Q1	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Qoal
346	6/4-15Q1			2	48	0.6	14.6	clay and boulders	Clay and gravel	--	--	--	
346	6/4-15Q1			48	75	14.6	22.9	clay	Clay	--	--	--	
346	6/4-15Q1			75	84	22.9	25.6	rock, water	Ash or tuff	hard	--	--	
346	6/4-15Q1			84	105	25.6	32.0	clay	Clay	--	--	--	
346	6/4-15Q1			105	147	32.0	44.8	clay and gravel	Clay and gravel	--	--	--	
346	6/4-15Q1			147	162	44.8	49.4	gravel, dry	Gravel	--	--	--	
346	6/4-15Q1			162	185	49.4	56.4	tuff	Ash or tuff	--	--	--	Qh (?)
346	6/4-15Q1			185	210	56.4	64.0	gravel, some tuff; some water	Gravel	--	--	--	
346	6/4-15Q1			210	245	64.0	74.7	tuff, blue	Ash or tuff	--	--	--	
346	6/4-15Q1			245	264	74.7	80.5	tuff, gray; some water	Ash or tuff	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
346	6/4-15Q1			264	273	80.5	83.2	tuff, brown	Ash or tuff	--	--	--	
346	6/4-15Q1			273	295	83.2	89.9	lava and gravel, water	Basalt	--	--	--	
346	6/4-15Q1			295	303	89.9	92.4	tuff, gray	Ash or tuff	--	--	--	
347	6/4-15Q3	347	6/4-15Q3	0	5	0.0	1.5	soil	Sand and clay	--	--	--	Qoal and Qh (?)
347	6/4-15Q3			5	27	1.5	8.2	clay, and boulders	Clay and gravel	--	--	--	
347	6/4-15Q3			27	30	8.2	9.1	gravel, some water	Gravel	--	--	--	
347	6/4-15Q3			30	54	9.1	16.5	clay, and boulders	Clay and gravel	--	--	--	
347	6/4-15Q3			54	57	16.5	17.4	gravel, some water	Gravel	--	--	--	
347	6/4-15Q3			57	132	17.4	40.2	clay and boulders	Clay and gravel	--	--	--	
347	6/4-15Q3			132	135	40.2	41.1	gravel water	Gravel	--	--	--	
347	6/4-15Q3			135	177	41.1	53.9	boulders and clay	Clay and gravel	--	--	--	
347	6/4-15Q3			177	180	53.9	54.9	gravel, some water	Gravel	--	--	--	
347	6/4-15Q3			180	309	54.9	94.2	boulders and clay	Clay and gravel	--	--	--	
347	6/4-15Q3			309	327	94.2	99.7	gravel, water	Gravel	--	--	--	
348	6/4-22B3	348	6/4-22B3	0	3	0.0	0.9	soil and boulders	Clay, sand, and gravel	--	--	--	Qoal
348	6/4-22B3			3	54	0.9	16.5	hardpan and boulders	Clay and gravel	hard	--	--	
348	6/4-22B3			54	55	16.5	16.8	water, small amount	Clay and gravel	--	--	--	
348	6/4-22B3			55	102	16.8	31.1	clay and boulders	Clay and gravel	--	--	--	
348	6/4-22B3			102	106	31.1	32.3	boulders and water	Gravel	--	--	--	
348	6/4-22B3			106	237	32.3	72.2	clay and boulders	Clay and gravel	--	--	--	
349	6/4-22B2	349	6/4-22B2	0	50	0.0	15.2	boulders and clay	Clay and gravel	--	--	--	Qoal
349	6/4-22B2			50	53	15.2	16.2	gravel, water	Gravel	--	--	--	
349	6/4-22B2			53	110	16.2	33.5	clay and boulders	Clay and gravel	--	--	--	
349	6/4-22B2			110	113	33.5	34.4	gravel, water	Gravel	--	--	--	
349	6/4-22B2			113	117	34.4	35.7	boulders and clay	Clay and gravel	--	--	--	
350	6/4-19B1	350	6/4-19B1	0	80	0.0	24.4	clay and boulders	Clay and gravel	--	--	--	Qyal and Qoal (?)
350	6/4-19B1			80	125	24.4	38.1	volcanic flow with pyrite mineralization	Ash or tuff	--	--	--	
351	6/4-23F1	351	6/4-23F1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Tsv
351	6/4-23F1			3	18	0.9	5.5	boulders	Gravel	--	--	--	
351	6/4-23F1			18	90	5.5	27.4	rock, gray	Ash or tuff	hard	--	--	
351	6/4-23F1			90	96	27.4	29.3	rock, broken, and water	Ash or tuff	hard	--	--	
351	6/4-23F1			96	160	29.3	48.8	rock brown	Ash or tuff	--	--	--	
351	6/4-23F1			160	202	48.8	61.6	rock, gray	Ash or tuff	hard	--	--	
351	6/4-23F1			202	212	61.6	64.6	rock, broken, water	Ash or tuff	hard	--	--	
351	6/4-23F1			212	220	64.6	67.1	rock, gray	Ash or tuff	hard	--	--	
352	6/3-19M1	352	6/3-19M1	0	60	0.0	18.3	pumice	Ash or tuff	--	--	--	Qh
352	6/3-19M1			60	160	18.3	48.8	volcanic rock, black	Ash or tuff	--	--	--	
352	6/3-19M1			160	190	48.8	57.9	rock, soft red, source of water	Ash or tuff	hard	--	--	
353	6/4-23J1	353	6/4-23J1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Tsv
353	6/4-23J1			4	34	1.2	10.4	clay, yellow	Clay	--	--	--	
353	6/4-23J1			34	99	10.4	30.2	clay, blue	Clay	--	--	--	
353	6/4-23J1			99	123	30.2	37.5	clay, tough	Clay	--	--	--	
353	6/4-23J1			123	126	37.5	38.4	rock	Ash or tuff	hard	--	--	
353	6/4-23J1			126	147	38.4	44.8	boulders, cemented	Gravel	cemented	--	--	
353	6/4-23J1			147	288	44.8	87.8	tuff, brown	Ash or tuff	--	--	--	
353	6/4-23J1			288	333	87.8	101.5	boulders and tuff	Ash or tuff	--	--	--	
353	6/4-23J1			333	437	101.5	133.2	rock	Ash or tuff	hard	--	--	
353	6/4-23J1			437	514	133.2	156.7	diorite	Basalt	--	--	--	
353	6/4-23J1			514	545	156.7	166.1	cement	Clay, sand, and gravel	cemented	--	--	
353	6/4-23J1			545	592	166.1	180.4	conglomerate rock	Clay, sand, and gravel	--	--	--	
353	6/4-23J1			592	597	180.4	182.0	lava, water, 75 gpm or more	Basalt	--	--	--	
353	6/4-23J1			597	654	182.0	199.3	lava, cemented	Basalt	--	--	--	
353	6/4-23J1			654	675	199.3	205.7	lava, hard	Basalt	hard	--	--	
353	6/4-23J1			675	700	205.7	213.4	lava	Basalt	--	--	--	
354	6/4-21Q1	354	6/4-21Q1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qyal
354	6/4-21Q1			3	30	0.9	9.1	clay	Clay	--	--	--	
354	6/4-21Q1			30	49	9.1	14.9	water gravel	Gravel	--	--	--	
354	6/4-21Q1			49	64	14.9	19.5	clay	Clay	--	--	--	
354	6/4-21Q1			64	75	19.5	22.9	gravel, dry	Gravel	--	--	--	
354	6/4-21Q1			75	89	22.9	27.1	clay	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
354	6/4-21Q1			89	94	27.1	28.7	gravel	Gravel	--	--	--	
354	6/4-21Q1			94	110	28.7	33.5	clay	Clay	--	--	--	
355	6/4-27C2	355	6/4-27C2	0	5	0.0	1.5	soil	Sand and clay	--	--	--	Qoal
355	6/4-27C2			5	20	1.5	6.1	clay, yellow	Clay	--	--	--	
355	6/4-27C2			20	27	6.1	8.2	clay, blue	Clay	--	--	--	
355	6/4-27C2			27	33	8.2	10.1	gravel	Gravel	--	--	--	
355	6/4-27C2			33	93	10.1	28.3	clay, yellow	Clay	--	--	--	
355	6/4-27C2			93	98	28.3	29.9	gravel	Gravel	--	--	--	
355	6/4-27C2			98	110	29.9	33.5	clay	Clay	--	--	--	
355	6/4-27C2			110	115	33.5	35.1	gravel	Gravel	--	--	--	
355	6/4-27C2			115	132	35.1	40.2	clay, blue	Clay	--	--	--	
355	6/4-27C2			132	145	40.2	44.2	clay, yellow	Clay	--	--	--	
355	6/4-27C2			145	195	44.2	59.4	gravel, cemented	Gravel	cemented	--	--	
355	6/4-27C2			195	210	59.4	64.0	clay, yellow	Clay	--	--	--	
355	6/4-27C2			210	240	64.0	73.2	clay, yellow; and rock	Clay and gravel	--	--	--	
356	6/4-30C1	356	6/4-30C1	0	20	0.0	6.1	soil and clay	Sand and clay	--	--	--	Qoal
356	6/4-30C1			20	28	6.1	8.5	gravel, water	Gravel	--	--	--	
356	6/4-30C1			28	35	8.5	10.7	clay	Clay	--	--	--	
356	6/4-30C1			35	50	10.7	15.2	clay, gravel, water	Clay and gravel	--	--	--	
356	6/4-30C1			50	90	15.2	27.4	clay	Clay	--	--	--	
356	6/4-30C1			90	95	27.4	29.0	gravel, water	Gravel	--	--	--	
356	6/4-30C1			95	105	29.0	32.0	clay, boulders	Clay and gravel	--	--	--	
356	6/4-30C1			105	114	32.0	34.7	boulders, gravel	Gravel	--	--	--	
357	6/4-25B1	357	6/4-25B1	0	18	0.0	5.5	pumice	Ash or tuff	--	--	--	Tsv
357	6/4-25B1			18	63	5.5	19.2	tuff, blue	Ash or tuff	--	--	--	
357	6/4-25B1			63	93	19.2	28.3	tule mud, blue	Clay and sand (or sandstone)	--	--	tule	
357	6/4-25B1			93	105	28.3	32.0	rock, hard	Ash or tuff	hard	--	--	
357	6/4-25B1			105	123	32.0	37.5	lava, gray; some water	Basalt	--	--	--	
357	6/4-25B1			123	129	37.5	39.3	lava, black broken; water	Basalt	--	--	--	
358	6/4-25B2	358	6/4-25B2	0	5	0.0	1.5	surface	Sand and clay	--	--	--	Tsv
358	6/4-25B2			5	80	1.5	24.4	pumice, gray	Ash or tuff	--	--	--	
358	6/4-25B2			80	100	24.4	30.5	pumice, gray and boulders	Basalt	hard	--	--	
358	6/4-25B2			100	185	30.5	56.4	lava rock and boulders	Basalt	--	--	--	
359	6/4-25D1	359	6/4-25D1	0	32	0.0	9.8	sandstone, yellow, soft	Sandstone	cemented	--	--	Qh
359	6/4-25D1			32	55	9.8	16.8	gravelly sand, blue	Sand (or sandstone) and gravel	--	--	--	
359	6/4-25D1			55	85	16.8	25.9	clay, greenish	Clay	--	--	--	
359	6/4-25D1			85	140	25.9	42.7	volcanic matter; water	Ash or tuff	--	--	--	
359	6/4-25D1			140	255	42.7	77.7	broken rock and sandstone; water	Ash or tuff	cemented	--	--	
359	6/4-25D1			255	305	77.7	93.0	gravel and sand; water	Sand (or sandstone) and gravel	--	--	--	
360	6/4-26H1	360	6/4-26H1	0	18	0.0	5.5	soil	Sand and clay	--	--	--	Qh
360	6/4-26H1			18	42	5.5	12.8	hardpan	Clay and gravel	hard	--	--	
360	6/4-26H1			42	44	12.8	13.4	gravel, water	Gravel	--	--	--	
360	6/4-26H1			44	135	13.4	41.1	muck, yellow and boulders; water	Clay and gravel	--	--	--	
360	6/4-26H1			135	160	41.1	48.8	boulders, cemented	Gravel	cemented	--	--	
360	6/4-26H1			160	243	48.8	74.1	cement and cemented boulders	Gravel	cemented	--	--	
360	6/4-26H1			243	246	74.1	75.0	gravel water	Gravel	--	--	--	
360	6/4-26H1			246	258	75.0	78.6	rock, broken, and cement water	Clay, sand, and gravel	cemented	--	--	
360	6/4-26H1			258	282	78.6	86.0	sandy gravel and cement; water	Sand (or sandstone) and gravel	cemented	--	--	
360	6/4-26H1			282	327	86.0	99.7	tule mud	Clay and sand (or sandstone)	--	--	tule	
360	6/4-26H1			327	381	99.7	116.1	gravel, sand, and rock; water	Sand (or sandstone) and gravel	--	--	--	
360	6/4-26H1			381	418	116.1	127.4	broken basalt; water	Basalt	--	--	--	
360	6/4-26H1			418	432	127.4	131.7	lava, red; rock	Basalt	hard	--	--	
360	6/4-26H1			432	477	131.7	145.4	cement, red broken; water	Basalt	cemented	--	--	
360	6/4-26H1			477	477	145.4	145.4	gravel, cemented	Gravel	cemented	--	--	
360	6/4-26H1			477	516	145.4	157.3	gravel, cemented	Gravel	cemented	--	--	
360	6/4-26H1			516	540	164.6	181.4	lava, hard, stratified; water	Basalt	hard	--	--	
360	6/4-26H1			540	595	164.6	basalt, hard	Basalt	hard	--	--	--	
360	6/4-26H1			595	602	181.4	183.5	lava, cemented	Basalt	--	--	--	
360	6/4-26H1			602	643	183.5	196.0	lava, broken, water	Basalt	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
361	6/4-28F1	361	6/4-28F1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qoal
361	6/4-28F1			3	15	0.9	4.6	clay, yellow	Clay	--	--	--	
361	6/4-28F1			15	17	4.6	5.2	gravel	Gravel	--	--	--	
361	6/4-28F1			17	25	5.2	7.6	clay, yellow	Clay	--	--	--	
361	6/4-28F1			25	35	7.6	10.7	gravel, water	Gravel	--	--	--	
361	6/4-28F1			35	50	10.7	15.2	clay, yellow	Clay	--	--	--	
361	6/4-28F1			50	55	15.2	16.8	gravel, water	Gravel	--	--	--	
361	6/4-28F1			55	90	16.8	27.4	clay, yellow	Clay	--	--	--	
361	6/4-28F1			90	95	27.4	29.0	clay, yellow	Clay	--	--	--	
362	6/4-26F1	362	6/4-26F1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qoal
362	6/4-26F1			3	12	0.9	3.7	clay	Clay	--	--	--	
362	6/4-26F1			12	32	3.7	9.8	clay and boulders	Clay and gravel	--	--	--	
362	6/4-26F1			32	42	9.8	12.8	clay, blue	Clay	--	--	--	
362	6/4-26F1			42	45	12.8	13.7	rocks, broken; water	Gravel	hard	--	--	
362	6/4-26F1			45	84	13.7	25.6	clay, blue	Clay	--	--	--	
362	6/4-26F1			84	101	25.6	30.8	clay, gray	Clay	--	--	--	
362	6/4-26F1			101	131	30.8	39.9	clay, blue	Clay	--	--	--	
362	6/4-26F1			131	167	39.9	50.9	lava, mud	Basalt	--	--	--	Qh
362	6/4-26F1			167	171	50.9	52.1	lava, water	Basalt	--	--	--	
362	6/4-26F1			171	198	52.1	60.4	mud, volcanic	Ash or tuff	--	--	--	
362	6/4-26F1			198	204	60.4	62.2	lava, water	Basalt	--	--	--	
363	6/4-28K2	363	6/4-28K2	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Qoal
363	6/4-28K2			2	35	0.6	10.7	clay, yellow	Clay	--	--	--	
363	6/4-28K2			35	55	10.7	16.8	clay, yellow	Clay	--	--	--	
363	6/4-28K2			55	57	16.8	17.4	gravel, water	Gravel	--	--	--	
363	6/4-28K2			57	82	17.4	25.0	clay, yellow	Clay	--	--	--	
363	6/4-28K2			82	87	25.0	26.5	gravel, water	Gravel	--	--	--	
363	6/4-28K2			87	93	26.5	28.3	clay, sandy	Clay and sand (or sandstone)	--	--	--	
363	6/4-28K2			93	127	28.3	38.7	clay, blue	Clay	--	--	--	
363	6/4-28K2			127	145	38.7	44.2	gravel, water	Gravel	--	--	--	
363	6/4-28K2			145	155	44.2	47.2	clay, water	Clay	--	--	--	
364	6/4-26L2	364	6/4-26L2	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qoal
364	6/4-26L2			3	20	0.9	6.1	clay	Clay	--	--	--	
364	6/4-26L2			20	21	6.1	6.4	clay and gravel, some water	Clay and gravel	--	--	--	
364	6/4-26L2			21	36	6.4	11.0	clay and boulders	Clay and gravel	--	--	--	
364	6/4-26L2			36	45	11.0	13.7	clay, blue	Clay	--	--	--	
364	6/4-26L2			45	180	13.7	54.9	tuff and gravel, water	Ash or tuff	--	--	--	Qh (?)
365	6/4-26L1	365	6/4-26L1	0	174	0.0	53.0	previously drilled	No data	--	--	--	Qoal and Qh
365	6/4-26L1			174	176	53.0	53.6	clay, blue	Clay	--	--	--	
365	6/4-26L1			176	188	53.6	57.3	rock, hard	Ash or tuff	hard	--	--	Tsv (?)
365	6/4-26L1			188	194	57.3	59.1	rock, broken; water	Ash or tuff	hard	--	--	
365	6/4-26L1			194	225	59.1	68.6	clay, gray	Clay	--	--	--	
365	6/4-26L1			225	230	68.6	70.1	rock, broken; water	Ash or tuff	hard	--	--	
365	6/4-26L1			230	249	70.1	75.9	clay, gray	Clay	--	--	--	
366	6/4-27M1	366	6/4-27M1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qoal
366	6/4-27M1			3	24	0.9	7.3	clay, yellow	Clay	--	--	--	
366	6/4-27M1			24	26	7.3	7.9	gravel, water	Gravel	--	--	--	
366	6/4-27M1			26	90	7.9	27.4	clay, yellow	Clay	--	--	--	
366	6/4-27M1			90	100	27.4	30.5	gravel, water	Gravel	--	--	--	
366	6/4-27M1			100	108	30.5	32.9	clay, yellow	Clay	--	--	--	
367	6/4-26N1	367	6/4-26N1	0	12	0.0	3.7	soil	Sand and clay	--	--	--	Qyal and Qoal
367	6/4-26N1			12	26	3.7	7.9	clay	Clay	--	--	--	
367	6/4-26N1			26	39	7.9	11.9	clay, gravel, water	Clay and gravel	--	--	--	
367	6/4-26N1			39	61	11.9	18.6	clay	Clay	--	--	--	
367	6/4-26N1			61	63	18.6	19.2	clay, gravel, water	Clay and gravel	--	--	--	
367	6/4-26N1			63	96	19.2	29.3	boulders and clay	Clay and gravel	--	--	--	
367	6/4-26N1			96	102	29.3	31.1	boulders, sand, gravel, water	Sand (or sandstone) and gravel	--	--	--	
367	6/4-26N1			102	123	31.1	37.5	clay and gravel; some water	Clay and gravel	--	--	--	
367	6/4-26N1			123	144	37.5	43.9	clay, blue some water	Clay	--	--	--	
367	6/4-26N1			144	150	43.9	45.7	boulders and clay	Clay and gravel	--	--	--	
368	6/4-27N1	368	6/4-27N1	0	41	0.0	12.5	not described	No data	--	--	--	Qoal

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
368	6/4-27N1			41	54	12.5	16.5	gravel, sand, water	Sand (or sandstone) and gravel	--	--	--	
368	6/4-27N1			54	58	16.5	17.7	clay	Clay	--	--	--	
368	6/4-27N1			58	69	17.7	21.0	gravel, water	Gravel	--	--	--	
368	6/4-27N1			69	91	21.0	27.7	gravel, boulders, water	Gravel	--	--	--	
368	6/4-27N1			91	99	27.7	30.2	gravel, water	Gravel	--	--	--	
368	6/4-27N1			99	102	30.2	31.1	clay, soft	Clay	--	--	--	
368	6/4-27N1			102	115	31.1	35.1	gravel water	Gravel	--	--	--	
368	6/4-27N1			115	141	35.1	43.0	clay, gravel, water	Clay and gravel	--	--	--	
369	6/4-28Q1	369	6/4-28Q1	0	30	0.0	9.1	not described	No data	--	--	--	Qoal
369	6/4-28Q1			30	40	9.1	12.2	boulders and clay	Clay and gravel	--	--	--	
369	6/4-28Q1			40	43	12.2	13.1	gravel, water	Gravel	--	--	--	
369	6/4-28Q1			43	50	13.1	15.2	clay	Clay	--	--	--	
369	6/4-28Q1			50	52	15.2	15.8	gravel, water	Gravel	--	--	--	
369	6/4-28Q1			52	69	15.8	21.0	clay, yellow	Clay	--	--	--	
369	6/4-28Q1			69	81	21.0	24.7	clay, some water	Clay	--	--	--	
370	6/4-34D2	370	6/4-34D2	0	10	0.0	3.0	surface	Sand and clay	--	--	--	Qoal
370	6/4-34D2			10	45	3.0	13.7	clay, yellow	Clay	--	--	--	
370	6/4-34D2			45	65	13.7	19.8	gravel	Gravel	--	--	--	
370	6/4-34D2			65	85	19.8	25.9	clay and gravel	Clay and gravel	--	--	--	
370	6/4-34D2			85	105	25.9	32.0	clay, yellow	Clay	--	--	--	
370	6/4-34D2			105	110	32.0	33.5	rock and clay, mixed	Clay and gravel	--	--	--	
370	6/4-34D2			110	125	33.5	38.1	clay, yellow	Clay	--	--	--	
370	6/4-34D2			125	130	38.1	39.6	boulders and clay	Clay and gravel	--	--	--	
370	6/4-34D2			130	150	39.6	45.7	clay, yellow	Clay	--	--	--	
370	6/4-34D2			150	155	45.7	47.2	clay and gravel	Clay and gravel	--	--	--	
370	6/4-34D2			155	190	47.2	57.9	clay, yellow	Clay	--	--	--	
370	6/4-34D2			190	193	57.9	58.8	gravel	Gravel	--	--	--	
370	6/4-34D2			193	205	58.8	62.5	clay, yellow	Clay	--	--	--	
370	6/4-34D2			205	235	62.5	71.6	gravel and clay	Clay and gravel	--	--	--	
370	6/4-34D2			235	243	71.6	74.1	clay, yellow	Clay	--	--	--	
370	6/4-34D2			243	247	74.1	75.3	gravel and clay	Clay and gravel	--	--	--	
370	6/4-34D2			247	255	75.3	77.7	clay, yellow	Clay	--	--	--	
370	6/4-34D2			255	265	77.7	80.8	gravel and clay	Clay and gravel	--	--	--	
370	6/4-34D2			265	285	80.8	86.9	clay, yellow	Clay	--	--	--	
370	6/4-34D2			285	287	86.9	87.5	gravel	Gravel	--	--	--	
370	6/4-34D2			287	290	87.5	88.4	clay, yellow	Clay	--	--	--	
370	6/4-34D2			290	292	88.4	89.0	gravel	Gravel	--	--	--	
370	6/4-34D2			292	315	89.0	96.0	clay, yellow	Clay	--	--	--	
370	6/4-34D2			315	317	96.0	96.6	boulders and gravel	Gravel	--	--	--	
370	6/4-34D2			317	343	96.6	104.5	clay, yellow	Clay	--	--	--	
370	6/4-34D2			343	347	104.5	105.8	gravel	Gravel	--	--	--	
370	6/4-34D2			347	365	105.8	111.3	gravel and clay	Clay and gravel	--	--	--	
370	6/4-34D2			365	380	111.3	115.8	clay, yellow	Clay	--	--	--	
371	6/4-36C1	371	6/4-36C1	0	140	0.0	42.7	not described	No data	--	--	--	Qyal (?)
371	6/4-36C1			140	145	42.7	44.2	rock, blue	Sandstone	hard	--	--	
371	6/4-36C1			145	162	44.2	49.4	clay, blue	Clay	--	--	--	
371	6/4-36C1			162	231	49.4	70.4	gravel and rock, water	Gravel	--	--	--	
371	6/4-36C1			231	240	70.4	73.2	clay, blue	Clay	--	--	--	
371	6/4-36C1			240	387	73.2	118.0	sandstone	Sandstone	cemented	--	--	
371	6/4-36C1			387	396	118.0	120.7	gravel and water, good flow	Gravel	--	--	--	
371	6/4-36C1			396	400	120.7	121.9	rock, blue	Sandstone	hard	--	--	
371	6/4-36C1			400	405	121.9	123.4	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
371	6/4-36C1			405	447	123.4	136.2	clay	Clay	--	--	--	
372	6/4-35G2	372	6/4-35G2	0	4	0.0	1.2	surface	Sand and clay	--	--	--	Qoal
372	6/4-35G2			4	12	1.2	3.7	clay and boulders	Clay and gravel	--	--	--	
372	6/4-35G2			12	25	3.7	7.6	clay and boulders, yellow	Clay and gravel	--	--	--	
372	6/4-35G2			25	35	7.6	10.7	clay and boulders, blue	Clay and gravel	--	--	--	
372	6/4-35G2			35	85	10.7	25.9	clay, yellow	Clay	--	--	--	
372	6/4-35G2			85	97	25.9	29.6	gravel and boulders, water	Gravel	--	--	--	
372	6/4-35G2			97	140	29.6	42.7	clay, yellow	Clay	--	--	--	
372	6/4-35G2			140	190	42.7	57.9	clay and gravel, yellow	Clay and gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
372	6/4-35G2			190	224	57.9	68.3	clay, blue	Clay	--	--	--	
372	6/4-35G2			224	250	68.3	76.2	volcanic ash, blue, water	Ash or tuff	--	--	--	Tsv
372	6/4-35G2			250	258	76.2	78.6	clay, blue	Clay	--	--	--	
373	6/4-35G3	373	6/4-35G3	0	10	0.0	3.0	surface	Sand and clay	--	--	--	Qoal
373	6/4-35G3			10	30	3.0	9.1	clay, yellow; gravel, no water	Clay and gravel	--	--	--	
373	6/4-35G3			30	39	9.1	11.9	hard boulders	Gravel	hard	--	--	
373	6/4-35G3			39	80	11.9	24.4	clay, yellow and boulders	Clay and gravel	--	--	--	
373	6/4-35G3			80	85	24.4	25.9	boulders, some water	Gravel	--	--	--	
373	6/4-35G3			85	105	25.9	32.0	boulders and clay	Clay and gravel	--	--	--	
373	6/4-35G3			105	120	32.0	36.6	clay, yellow	Clay	--	--	--	
373	6/4-35G3			120	138	36.6	42.1	sand and broken rock	Sand (or sandstone) and gravel	hard	--	--	
373	6/4-35G3			138	147	42.1	44.8	clay, yellow	Clay	--	--	--	
373	6/4-35G3			147	160	44.8	48.8	clay, yellow; and sand	Clay and gravel	--	--	--	
373	6/4-35G3			160	220	48.8	67.1	clay, blue sand and gravel	Clay, sand, and gravel	--	--	--	
373	6/4-35G3			220	238	67.1	72.5	clay, yellow, and sand and gravel	Clay and sand (or sandstone)	--	--	--	
373	6/4-35G3			238	250	72.5	76.2	volcanic ash, blue	Ash or tuff	--	--	--	Tsv
373	6/4-35G3			250	260	76.2	79.2	lava rock, black	Basalt	hard	--	--	
374	6/4-35G4	374	6/4-35G4	0	10	0.0	3.0	surface	Sand and clay	--	--	--	Qoal
374	6/4-35G4			10	40	3.0	12.2	clay, yellow, and gravel	Clay and gravel	--	--	--	
374	6/4-35G4			40	55	12.2	16.8	clay, yellow	Clay	--	--	--	
374	6/4-35G4			55	120	16.8	36.6	clay, blue, and boulders	Clay and gravel	--	--	--	
374	6/4-35G4			120	135	36.6	41.1	clay, yellow, sand and gravel	Clay, sand, and gravel	--	--	--	
374	6/4-35G4			135	145	41.1	44.2	clay, yellow	Clay	--	--	--	
374	6/4-35G4			145	200	44.2	61.0	clay, blue and boulders	Clay and gravel	--	--	--	
374	6/4-35G4			200	215	61.0	65.5	clay, blue	Clay	--	--	--	
374	6/4-35G4			215	245	65.5	74.7	lava rock, soft, water	Basalt	hard	--	--	Tsv
374	6/4-35G4			245	250	74.7	76.2	basalt, water	Basalt	--	--	--	
375	6/4-33L2	375	6/4-33L2	0	6	0.0	1.8	soil	Sand and clay	--	--	--	Qyal and Qoal
375	6/4-33L2			6	21	1.8	6.4	clay	Clay	--	--	--	
375	6/4-33L2			21	40	6.4	12.2	sand, boulders, water	Sand	--	--	--	
375	6/4-33L2			40	56	12.2	17.1	boulders and clay	Clay and gravel	--	--	--	
375	6/4-33L2			56	65	17.1	19.8	clay	Clay	--	--	--	
375	6/4-33L2			65	140	19.8	42.7	boulders and clay	Clay and gravel	--	--	--	
375	6/4-33L2			140	155	42.7	47.2	clay	Clay	--	--	--	
375	6/4-33L2			155	170	47.2	51.8	boulders and clay	Clay and gravel	--	--	--	
375	6/4-33L2			170	198	51.8	60.4	clay	Clay	--	--	--	
375	6/4-33L2			198	202	60.4	61.6	gravel, sand, water	Sand (or sandstone) and gravel	--	--	--	
376	6/4-35L2	376	6/4-35L2	0	6	0.0	1.8	surface	Sand and clay	--	--	--	Qyal
376	6/4-35L2			6	15	1.8	4.6	boulders	Gravel	--	--	--	
376	6/4-35L2			15	68	4.6	20.7	clay, yellow	Clay	--	--	--	Qoal
376	6/4-35L2			68	75	20.7	22.9	boulders	Gravel	--	--	--	
376	6/4-35L2			75	93	22.9	28.3	clay, yellow	Clay	--	--	--	
376	6/4-35L2			93	102	28.3	31.1	boulders	Gravel	--	--	--	
376	6/4-35L2			102	150	31.1	45.7	clay, yellow	Clay	--	--	--	
376	6/4-35L2			150	165	45.7	50.3	clay and some gravel, yellow	Clay and gravel	--	--	--	
376	6/4-35L2			165	175	50.3	53.3	clay and some gravel, blue	Clay and gravel	--	--	--	
376	6/4-35L2			175	250	53.3	76.2	volcanic ash, black	Ash or tuff	--	--	--	Tsv
376	6/4-35L2			250	260	76.2	79.2	hard lava or soft basalt	Basalt	hard	--	--	
377	6/4-36J1	377	6/4-36J1	0	60	0.0	18.3	boulders and conglomerate	Clay, sand, and gravel	--	--	--	
377	6/4-36J1			60	325	18.3	99.1	tule mud	Clay and sand (or sandstone)	--	--	--	tule
377	6/4-36J1			325	328	99.1	100.0	gravel	Gravel	--	--	--	
377	6/4-36J1			328	432	100.0	131.7	shale, blue, with gravel	Clay and sand (or sandstone)	cemented	--	--	
378	6/4-36L1	378	6/4-36L1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qyal
378	6/4-36L1			3	25	0.9	7.6	boulders and sand	Sand (or sandstone) and gravel	--	--	--	
378	6/4-36L1			25	115	7.6	35.1	tuff and boulders; some water	Ash or tuff	--	--	--	Tsv
378	6/4-36L1			115	228	35.1	69.5	rock, hard	Ash or tuff	hard	--	--	
378	6/4-36L1			228	243	69.5	74.1	lava, broken; some water	Basalt	--	--	--	
379	6/4-32J1	379	6/4-32J1	0	10	0.0	3.0	surface	Sand and clay	--	--	--	Qyal and Qoal
379	6/4-32J1			10	170	3.0	51.8	clay, yellow, sand and gravel	Clay, sand, and gravel	--	--	--	
379	6/4-32J1			170	445	51.8	135.6	clay, yellow	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
379	6/4-32J1			445	462	135.6	140.8	clay, yellow, sand and gravel	Clay, sand, and gravel	--	--	--	
379	6/4-32J1			462	475	140.8	144.8	clay, yellow	Clay	--	--	--	
380	6/4-33M1	380	6/4-33M1	0	2	0.0	0.6	topsoil	Sand and clay	--	--	--	Qyal and Qoal
380	6/4-33M1			2	15	0.6	4.6	clay, yellow	Clay	--	--	--	
380	6/4-33M1			15	22	4.6	6.7	clay and boulders, yellow	Clay and gravel	--	--	--	
380	6/4-33M1			22	62	6.7	18.9	clay, gravel, yellow	Clay and gravel	--	--	--	
380	6/4-33M1			62	110	18.9	33.5	clay, yellow	Clay	--	--	--	
380	6/4-33M1			110	133	33.5	40.5	gravel	Gravel	--	--	--	
380	6/4-33M1			133	167	40.5	50.9	clay and gravel, yellow	Clay and gravel	--	--	--	
380	6/4-33M1			167	176	50.9	53.6	clay, yellow	Clay	--	--	--	
381	6/4-35P2	381	6/4-35P2	0	5	0.0	1.5	soil	Sand and clay	--	--	--	Qyal and Qoal
381	6/4-35P2			5	26	1.5	7.9	sand loam	Sand and clay	--	--	--	
381	6/4-35P2			26	48	7.9	14.6	gravel and water	Gravel	--	--	--	
381	6/4-35P2			48	76	14.6	23.2	lava mud, white	Sand and clay	--	--	--	
381	6/4-35P2			76	77	23.2	23.5	gravel and water	Gravel	--	--	--	
381	6/4-35P2			77	84	23.5	25.6	cemented gravel and lava	Gravel	cemented	--	--	
381	6/4-35P2			84	85	25.6	25.9	gravel and water	Gravel	--	--	--	
381	6/4-35P2			85	97	25.9	29.6	lava gray	Basalt	--	--	--	
381	6/4-35P2			97	100	29.6	30.5	gravel and water	Gravel	--	--	--	
381	6/4-35P2			100	105	30.5	32.0	pumice	Ash or tuff	--	--	--	
382	6/4-32N1	382	6/4-32N1	0	30	0.0	9.1	soil and clay	Sand and clay	--	--	--	Knoxville and Horsetown Formations
382	6/4-32N1			30	165	9.1	50.3	shale, blue	Clay and sand (or sandstone)	cemented	--	--	
382	6/4-32N1			165	246	50.3	75.0	clay, yellow and boulders	Clay and gravel	--	--	--	
382	6/4-32N1			246	247	75.0	75.3	gravel, some water	Gravel	--	--	--	
382	6/4-32N1			247	398	75.3	121.3	clay, yellow, and some boulders	Clay and gravel	--	--	--	
382	6/4-32N1			398	502	121.3	153.0	clay, sandy	Clay and sand (or sandstone)	--	--	--	
382	6/4-32N1			502	519	153.0	158.2	sand, gravel, some water	Sand (or sandstone) and gravel	--	--	--	
383	6/4-35Q1	383	6/4-35Q1	0	60	0.0	18.3	tuff and rock	Ash or tuff	--	--	--	Tsv
383	6/4-35Q1			60	81	18.3	24.7	rock, broken	Ash or tuff	hard	--	--	
383	6/4-35Q1			81	86	24.7	26.2	not described	No data	--	--	--	
383	6/4-35Q1			86	117	26.2	35.7	rock, red	Ash or tuff	hard	--	--	
383	6/4-35Q1			117	135	35.7	41.1	tuff and boulders, yellow	Ash or tuff	--	--	--	
383	6/4-35Q1			135	142	41.1	43.3	lava, water	Basalt	--	--	--	
383	6/4-35Q1			142	162	43.3	49.4	rock and tuff, white	Ash or tuff	--	--	--	
383	6/4-35Q1			162	173	49.4	52.7	lava, water	Basalt	--	--	--	
383	6/4-35Q1			165	192	50.3	58.5	lava, water	Basalt	--	--	--	
383	6/4-35Q1			173	165	52.7	50.3	rock	Ash or tuff	hard	--	--	
384	6/4-35R1	384	6/4-35R1	0	15	0.0	4.6	surface boulders	Sand and clay	--	--	--	Tsv
384	6/4-35R1			15	170	4.6	51.8	volcanic rock, hard, red	Ash or tuff	hard	--	--	
384	6/4-35R1			170	190	51.8	57.9	boulders	Gravel	--	--	--	
384	6/4-35R1			190	240	57.9	73.2	lava rock, red	Basalt	hard	--	--	
384	6/4-35R1			240	265	73.2	80.8	lava rock, gray	Basalt	hard	--	--	
384	6/4-35R1			265	280	80.8	85.3	tuff, gray	Ash or tuff	--	--	--	
384	6/4-35R1			280	310	85.3	94.5	basalt	Basalt	--	--	--	
384	6/4-35R1			310	335	94.5	102.1	basaltic conglomerate	Basalt	--	--	--	
384	6/4-35R1			335	360	102.1	109.7	basalt	Basalt	--	--	--	
384	6/4-35R1			360	382	109.7	116.4	tuff, hard gray	Ash or tuff	hard	--	--	
385	5/4-2B1	385	5/4-2B1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qoal
385	5/4-2B1			3	30	0.9	9.1	hardpan	Clay and gravel	hard	--	--	
385	5/4-2B1			30	56	9.1	17.1	rock, yellow	Ash or tuff	hard	--	--	
385	5/4-2B1			56	57	17.1	17.4	water, little	Ash or tuff	--	--	--	
385	5/4-2B1			57	80	17.4	24.4	rock, yellow	Ash or tuff	hard	--	--	
385	5/4-2B1			80	130	24.4	39.6	rock, brown	Ash or tuff	hard	--	--	
385	5/4-2B1			130	160	39.6	48.8	rock, red	Ash or tuff	hard	--	--	
385	5/4-2B1			160	202	48.8	61.6	rock, brown; water	Ash or tuff	hard	--	--	
386	5/4-1G1	386	5/4-1G1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Tsv
386	5/4-1G1			3	28	0.9	8.5	tuff	Ash or tuff	--	--	--	
386	5/4-1G1			28	49	8.5	14.9	clay	Clay	--	--	--	
386	5/4-1G1			49	58	14.9	17.7	rocks, water at 57 ft.	Ash or tuff	hard	--	--	
386	5/4-1G1			58	61	17.7	18.6	tuff	Ash or tuff	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
386	5/4-1G1			61	78	18.6	23.8	rocks and water	Ash or tuff	hard	--	--	
387	5/4-5H4	387	5/4-5H4	0	8	0.0	2.4	soil	Sand and clay	--	--	--	Qyal and Qoal
387	5/4-5H4			8	17	2.4	5.2	clay, yellow	Clay	--	--	--	
387	5/4-5H4			17	26	5.2	7.9	clay, yellow; and boulders	Clay and gravel	--	--	--	
387	5/4-5H4			26	36	7.9	11.0	clay, yellow	Clay	--	--	--	
387	5/4-5H4			36	37	11.0	11.3	gravel, water	Gravel	--	--	--	
387	5/4-5H4			37	66	11.3	20.1	clay, yellow	Clay	--	--	--	
387	5/4-5H4			66	68	20.1	20.7	gravel, water	Gravel	--	--	--	
387	5/4-5H4			68	75	20.7	22.9	boulders and clay	Clay and gravel	--	--	--	
388	5/3-6M2	388	5/3-6M2	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Tsv
								chalk and rock (diatomite and rock)	Clay and sand (or sandstone)	--	--	--	
388	5/3-6M2			4	24	1.2	7.3	boulders and clay	Clay and gravel	--	--	--	
388	5/3-6M2			24	35	7.3	10.7	gravel, water	Gravel	--	--	--	
388	5/3-6M2			35	38	10.7	11.6	rock, blue	Ash or tuff	hard	--	--	
388	5/3-6M2			38	60	11.6	18.3	rock, water	Ash or tuff	hard	--	--	
388	5/3-6M2			60	65	18.3	19.8		Sand and clay	--	--	--	Tsv
389	5/3-6M1	389	5/3-6M1	0	5	0.0	1.5	soil	Clay	--	--	--	
389	5/3-6M1			5	45	1.5	13.7	clay	Clay and gravel	--	--	--	
389	5/3-6M1			45	55	13.7	16.8	clay, boulders; water	Clay and gravel	--	--	--	
389	5/3-6M1			55	147	16.8	44.8	clay and boulders	Clay and gravel	--	--	--	
389	5/3-6M1			147	163	44.8	49.7	lava, blue; water	Basalt	--	--	--	
389	5/3-6M1			163	170	49.7	51.8	lava, hard	Basalt	hard	--	--	
389	5/3-6M1			170	190	51.8	57.9	conglomerate, brown	Clay, sand, and gravel	--	--	--	
389	5/3-6M1			190	197	57.9	60.0	lava, red; water	Basalt	--	--	--	
389	5/3-6M1			197	205	60.0	62.5	conglomerate, gray	Clay, sand, and gravel	--	--	--	
389	5/3-6M1			205	250	62.5	76.2	not described	No data	--	--	--	
389	5/3-6M1			250	295	76.2	89.9	lava, water	Basalt	--	--	--	
390	5/4-3M1	390	5/4-3M1	0	9	0.0	2.7	soil	Sand and clay	--	--	--	Qyal and Qoal
390	5/4-3M1			9	40	2.7	12.2	clay	Clay	--	--	--	
390	5/4-3M1			40	44	12.2	13.4	gravel and water	Gravel	--	--	--	
390	5/4-3M1			44	80	13.4	24.4	clay	Clay	--	--	--	
390	5/4-3M1			80	85	24.4	25.9	gravel	Gravel	--	--	--	
390	5/4-3M1			85	107	25.9	32.6	clay	Clay	--	--	--	
390	5/4-3M1			107	110	32.6	33.5	gravel	Gravel	--	--	--	
390	5/4-3M1			110	168	33.5	51.2	clay	Clay	--	--	--	
390	5/4-3M1			168	174	51.2	53.0	gravel, water	Gravel	--	--	--	
390	5/4-3M1			174	200	53.0	61.0	clay	Clay	--	--	--	
390	5/4-3M1			200	204	61.0	62.2	gravel	Gravel	--	--	--	
390	5/4-3M1			204	278	62.2	84.7	clay	Clay	--	--	--	
390	5/4-3M1			278	280	84.7	85.3	gravel	Gravel	--	--	--	
390	5/4-3M1			280	290	85.3	88.4	clay	Clay	--	--	--	
390	5/4-3M1			290	304	88.4	92.7	gravel, water	Gravel	--	--	--	
390	5/4-3M1			304	375	92.7	114.3	clay	Clay	--	--	--	
390	5/4-3M1			375	380	114.3	115.8	water-sand	Sand	--	--	--	
390	5/4-3M1			380	665	115.8	202.7	clay and gravel, mixed	Clay and gravel	--	--	--	
390	5/4-3M1			665	675	202.7	205.7	gravel, no water	Gravel	--	--	--	
390	5/4-3M1			675	780	205.7	237.7	clay	Clay	--	--	--	
390	5/4-3M1			780	805	237.7	245.4	gravel, water	Gravel	--	--	--	
390	5/4-3M1			805	865	245.4	263.7	clay	Clay	--	--	--	
391	5/3-5M2	391	5/3-5M2	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Tsv
391	5/3-5M2			3	66	0.9	20.1	tuff	Ash or tuff	--	--	--	
391	5/3-5M2			66	69	20.1	21.0	rock, broken; water	Ash or tuff	hard	--	--	
391	5/3-5M2			69	128	21.0	39.0	tuff	Ash or tuff	--	--	--	
391	5/3-5M2			128	132	39.0	40.2	rock, broken; water	Ash or tuff	hard	--	--	
391	5/3-5M2			132	135	40.2	41.1	tuff	Ash or tuff	--	--	--	
392	5/3-6J1	392	5/3-6J1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Tsv
392	5/3-6J1			3	70	0.9	21.3	diatomite	Clay and sand (or sandstone)	--	--	--	
392	5/3-6J1			70	85	21.3	25.9	tule mud	Clay and sand (or sandstone)	--	--	tule	
392	5/3-6J1			85	150	25.9	45.7	not described	No data	--	--	--	
392	5/3-6J1			150	176	45.7	53.6	rock, hard	Ash or tuff	hard	--	--	
392	5/3-6J1			176	255	53.6	77.7	lava, vesicular	Basalt	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
392	5/3-6J1			255	265	77.7	80.8	lava, brown basalt, (some quartz grains in washed cuttings)	Basalt	--	--	--	
392	5/3-6J1			265	290	80.8	88.4		Basalt	--	--	--	
393	5/4-4K2	393	5/4-4K2	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qyal and Qoal
393	5/4-4K2			3	25	0.9	7.6	clay, yellow	Clay	--	--	--	
393	5/4-4K2			25	27	7.6	8.2	gravel, water	Gravel	--	--	--	
393	5/4-4K2			27	36	8.2	11.0	clay, yellow	Clay	--	--	--	
393	5/4-4K2			36	38	11.0	11.6	clay, blue	Clay	--	--	--	
393	5/4-4K2			38	51	11.6	15.5	clay, yellow	Clay	--	--	--	
393	5/4-4K2			51	65	15.5	19.8	gravel, water	Gravel	--	--	--	
393	5/4-4K2			65	87	19.8	26.5	clay, yellow	Clay	--	--	--	
393	5/4-4K2			87	92	26.5	28.0	gravel, water	Gravel	--	--	--	
394	5/3-5N3	394	5/3-5N3	0	22	0.0	6.7	rock and clay	Clay and gravel	--	--	--	Tsv
394	5/3-5N3			22	32	6.7	9.8	tule mud, brown	Clay and sand (or sandstone)	--	--	--	
394	5/3-5N3			32	51	9.8	15.5	tule mud, black	Clay and sand (or sandstone)	--	--	--	
394	5/3-5N3			51	124	15.5	37.8	rock and lava	Ash or tuff	--	--	--	
394	5/3-5N3			124	128	37.8	39.0	basalt rock, hard	Basalt	hard	--	--	
394	5/3-5N3			128	151	39.0	46.0	lava, gray	Basalt	--	--	--	
394	5/3-5N3			151	182	46.0	55.5	lava, blue; and water	Basalt	--	--	--	
394	5/3-5N3			182	192	55.5	58.5	basalt rock, hard	Basalt	hard	--	--	
395	5/3-5P1	395	5/3-5P1	0	30	0.0	9.1	tuff	Ash or tuff	--	--	--	Tsv
395	5/3-5P1			30	39	9.1	11.9	chalk (diatomite)	Clay and sand (or sandstone)	--	--	--	
395	5/3-5P1			39	84	11.9	25.6	clay	Clay	--	--	--	
395	5/3-5P1			84	183	25.6	55.8	tuff	Ash or tuff	--	--	--	
395	5/3-5P1			183	195	55.8	59.4	gravel, water	Gravel	--	--	--	
395	5/3-5P1			195	224	59.4	68.3	rocks, hard	Ash or tuff	hard	--	--	
395	5/3-5P1			224	234	68.3	71.3	gravel, water	Gravel	--	--	--	
395	5/3-5P1			234	263	71.3	80.2	cement	Clay, sand, and gravel	cemented	--	--	
395	5/3-5P1			263	278	80.2	84.7	rocks	Ash or tuff	hard	--	--	
395	5/3-5P1			278	368	84.7	112.2	cement	Clay, sand, and gravel	cemented	--	--	
395	5/3-5P1			368	391	112.2	119.2	gravel, cemented	Gravel	cemented	--	--	
395	5/3-5P1			391	411	119.2	125.3	gravel, water	Gravel	--	--	--	
395	5/3-5P1			411	420	125.3	128.0	cement	Clay, sand, and gravel	cemented	--	--	
395	5/3-5P1			420	450	128.0	137.2	diorite	Basalt	--	--	--	
396	5/4-5R1	396	5/4-5R1	0	4	0.0	1.2	soil, black	Sand and clay	--	--	--	Qyal and Qoal
396	5/4-5R1			4	25	1.2	7.6	clay, yellow	Clay	--	--	--	
396	5/4-5R1			25	26	7.6	7.9	gravel and water	Gravel	--	--	--	
396	5/4-5R1			26	40	7.9	12.2	clay, blue	Clay	--	--	--	
396	5/4-5R1			40	41	12.2	12.5	water, small amount	Clay	--	--	--	
396	5/4-5R1			41	46	12.5	14.0	lava mud, green	Basalt	--	--	--	
396	5/4-5R1			46	67	14.0	20.4	lava, broken; water-bearing	Basalt	--	--	--	
396	5/4-5R1			67	70	20.4	21.3	shale, blue	Clay and sand (or sandstone)	cemented	--	--	
397	5/3-6N2	397	5/3-6N2	0	8	0.0	2.4	soil	Sand and clay	--	--	--	KJu Tsv
397	5/3-6N2			8	48	2.4	14.6	chalk rock (diatomite)	Clay and sand (or sandstone)	--	--	--	
397	5/3-6N2			48	130	14.6	39.6	rock, white (tuff)	Ash or tuff	hard	--	--	
397	5/3-6N2			130	150	39.6	45.7	rock, broken; water	Ash or tuff	hard	--	--	
397	5/3-6N2			150	205	45.7	62.5	rock, white	Ash or tuff	hard	--	--	
398	5/4-5Q2	398	5/4-5Q2	0	50	0.0	15.2	clay, blue, and silt	Clay and sand (or sandstone)	--	--	--	Qyal
398	5/4-5Q2			50	150	15.2	45.7	sandstone, yellow	Sandstone	cemented	--	--	
398	5/4-5Q2			150	150	45.7	45.7	shale, blue	Clay and sand (or sandstone)	cemented	--	--	
399	5/4-1R1	399	5/4-1R1	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Tsv
399	5/4-1R1			2	20	0.6	6.1	tuff, white	Ash or tuff	--	--	--	
399	5/4-1R1			20	41	6.1	12.5	clay, yellow	Clay	--	--	--	
399	5/4-1R1			41	50	12.5	15.2	rock	Ash or tuff	hard	--	--	
399	5/4-1R1			50	60	15.2	18.3	tuff, white	Ash or tuff	--	--	--	
399	5/4-1R1			60	71	18.3	21.6	rock, brown	Ash or tuff	hard	--	--	
399	5/4-1R1			71	96	21.6	29.3	tuff, gray; and boulders	Ash or tuff	--	--	--	
399	5/4-1R1			96	151	29.3	46.0	rock, broken	Ash or tuff	hard	--	--	
399	5/4-1R1			151	192	46.0	58.5	rock, clay; some water	Clay and gravel	hard	--	--	
399	5/4-1R1			192	199	58.5	60.7	rock, hard	Ash or tuff	hard	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>	
399	5/4-1R1			199	214	60.7	65.2	clay	Clay	--	--	--		
399	5/4-1R1			214	224	65.2	68.3	rock, hard	Ash or tuff	hard	--	--		
399	5/4-1R1			224	228	68.3	69.5	rock, brown	Ash or tuff	hard	--	--		
399	5/4-1R1			228	232	69.5	70.7	rock, brown	Ash or tuff	hard	--	--		
399	5/4-1R1			232	235	70.7	71.6	rock, hard	Ash or tuff	hard	--	--		
399	5/4-1R1			235	283	71.6	86.3	rock, hard	Ash or tuff	hard	--	--		
399	5/4-1R1			283	333	86.3	101.5	lava; some water	Basalt	--	--	--		
399	5/4-1R1			333	339	101.5	103.3	tuff	Ash or tuff	--	--	--		
399	5/4-1R1			339	349	103.3	106.4	rock, white	Ash or tuff	hard	--	--		
399	5/4-1R1							quartz gravel, cemented; some water						
400	5/3-6Q1	400	5/3-6Q1	349	369	106.4	112.5		Clay, sand, and gravel	cemented	--	--		
400	5/3-6Q1			0	3	0.0	0.9	soil	Sand and clay	--	--	--	Tsv	
400	5/3-6Q1			3	10	0.9	3.0	chalk rock (diatomite)	Clay and sand (or sandstone)	--	--	--		
400	5/3-6Q1			10	35	3.0	10.7	tule mud	Clay and sand (or sandstone)	--	--	tule		
400	5/3-6Q1			35	45	10.7	13.7	lava, blue; water	Basalt	--	--	--		
400	5/3-6Q1			45	75	13.7	22.9	lava, cemented, blue	Basalt	--	--	--		
400	5/3-6Q1			75	82	22.9	25.0	lava, black; water	Basalt	--	--	--		
400	5/3-6Q1			82	218	25.0	66.4	lava, cemented, blue	Basalt	--	--	--		
400	5/3-6Q1			218	225	66.4	68.6	lava, water	Basalt	--	--	--		
400	5/3-6Q1			225	228	68.6	69.5	rock, blue, hard	Ash or tuff	hard	--	--		
401	5/3-5N1	401	5/3-5N1	0	8	0.0	2.4	soil	Sand and clay	--	--	--	Tsv	
401	5/3-5N1			8	36	2.4	11.0	ash	Ash or tuff	--	--	--		
401	5/3-5N1			36	59	11.0	18.0	tuff	Ash or tuff	--	--	--		
401	5/3-5N1			59	62	18.0	18.9	rock, broken; water	Ash or tuff	hard	--	--		
401	5/3-5N1			62	120	18.9	36.6	lava, cemented	Basalt	--	--	--		
401	5/3-5N1			120	130	36.6	39.6	lava, broken; water	Basalt	--	--	--		
401	5/3-5N1			130	135	39.6	41.1	lava, cemented	Basalt	--	--	--		
402	5/3-6N1	402	5/3-6N1	0	1	0.0	0.3	soil	Sand and clay	--	--	--	Tsv	
402	5/3-6N1			1	30	0.3	9.1	hardpan and boulders	Clay and gravel	hard	--	--		
402	5/3-6N1			30	45	9.1	13.7	rock, blue	Ash or tuff	hard	--	--		
402	5/3-6N1			45	46	13.7	14.0	water	Ash or tuff	--	--	--		
402	5/3-6N1			46	110	14.0	33.5	rock, blue	Ash or tuff	hard	--	--		
402	5/3-6N1			110	115	33.5	35.1	rock, water	Ash or tuff	hard	--	--		
402	5/3-6N1			115	120	35.1	36.6	rock	Ash or tuff	hard	--	--		
403	5/3-6N3	403	5/3-6N3	0	18	0.0	5.5	rock and clay	Clay and gravel	--	--	--	Tsv	
403	5/3-6N3			18	55	5.5	16.8	clay	Clay	--	--	--		
403	5/3-6N3			55	63	16.8	19.2	gravel and sand; water	Sand (or sandstone) and gravel	--	--	--		
403	5/3-6N3			63	86	19.2	26.2	rock and clay	Clay and gravel	--	--	--		
403	5/3-6N3			86	87	26.2	26.5	gravel, water	Gravel	--	--	--		
403	5/3-6N3			87	120	26.5	36.6	rock	Ash or tuff	hard	--	--		
403	5/3-6N3			120	146	36.6	44.5	rocks, water	Ash or tuff	hard	--	--		
404	5/4-3Q1	404	5/4-3Q1	0	40	0.0	12.2	dug well not described	No data	--	--	--	Qyal	
404	5/4-3Q1			40	78	12.2	23.8	clay, yellow	Clay	--	--	--		
404	5/4-3Q1			78	97	23.8	29.6	boulders and clay; water	Clay and gravel	--	--	--	Qoal (?)	
404	5/4-3Q1			97	112	29.6	34.1	clay, yellow	Clay	--	--	--		
404	5/4-3Q1			112	123	34.1	37.5	clay, white	Clay	--	--	--		
404	5/4-3Q1			123	138	37.5	42.1	clay	Clay	--	--	--		
404	5/4-3Q1			138	177	42.1	53.9	clay and boulders	Clay and gravel	--	--	--		
404	5/4-3Q1			177	178	53.9	54.3	gravel, water	Gravel	--	--	--		
404	5/4-3Q1			178	196	54.3	59.7	clay	Clay	--	--	--		
404	5/4-3Q1			196	227	59.7	69.2	clay and boulders	Clay and gravel	--	--	--		
404	5/4-3Q1			227	234	69.2	71.3	clay, yellow	Clay	--	--	--		
404	5/4-3Q1			234	239	71.3	72.8	boulders and clay	Clay and gravel	--	--	--		
404	5/4-3Q1			239	241	72.8	73.5	gravel, water	Gravel	--	--	--		
405	5/4-12B1	405	5/4-12B1	0	2	0.0	0.6	topsoil	Sand and clay	--	--	--	Tsv	
405	5/4-12B1			2	3	0.6	0.9	clay, gravel	Clay and gravel	--	--	--		
405	5/4-12B1			3	17	0.9	5.2	rock, porous	Ash or tuff	hard	--	--		
405	5/4-12B1			17	18	5.2	5.5	clay, gravel	Clay and gravel	--	--	--		
405	5/4-12B1			18	26	5.5	7.9	rock	Ash or tuff	hard	--	--		
405	5/4-12B1			26	27	7.9	8.2	sand rock	Sandstone	cemented	--	--		
405	5/4-12B1			27	31	8.2	9.4	rock, hard	Ash or tuff	hard	--	--		

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
405	5/4-12B1			31	38	9.4	11.6	boulders	Gravel	--	--	--	
405	5/4-12B1			38	46	11.6	14.0	rock, coarse gravel	Gravel	hard	--	--	
405	5/4-12B1			46	49	14.0	14.9	rock	Ash or tuff	hard	--	--	
405	5/4-12B1			49	55	14.9	16.8	rock, white	Ash or tuff	hard	--	--	
405	5/4-12B1			55	76	16.8	23.2	rock, porous	Ash or tuff	hard	--	--	
405	5/4-12B1			76	108	23.2	32.9	rock, red, porous	Ash or tuff	hard	--	--	
405	5/4-12B1			108	126	32.9	38.4	shale	Clay and sand (or sandstone)	cemented	--	--	
405	5/4-12B1			126	141	38.4	43.0	rock	Ash or tuff	hard	--	--	
405	5/4-12B1			141	150	43.0	45.7	gravel, sandy	Sand (or sandstone) and gravel	--	--	--	
406	5/3-8C1	406	5/3-8C1	0	1	0.0	0.3	soil	Sand and clay	--	--	--	Tsv
406	5/3-8C1			1	20	0.3	6.1	tuff, brown	Ash or tuff	--	--	--	
406	5/3-8C1			20	54	6.1	16.5	tuff, green	Ash or tuff	--	--	--	
406	5/3-8C1			54	56	16.5	17.1	lava and water	Basalt	--	--	--	
406	5/3-8C1			56	80	17.1	24.4	tuff, gray	Ash or tuff	--	--	--	
406	5/3-8C1			80	90	24.4	27.4	lava and water, flowing	Basalt	--	--	--	
406	5/3-8C1			90	95	27.4	29.0	lava	Basalt	--	--	--	
407	5/3-7D1	407	5/3-7D1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Tsv
407	5/3-7D1			4	8	1.2	2.4	chalk rock (diatomite)	Clay and sand (or sandstone)	--	--	--	
407	5/3-7D1			8	65	2.4	19.8	tule mud	Clay and sand (or sandstone)	--	--	tule	
407	5/3-7D1			65	70	19.8	21.3	lava, cemented, blue	Basalt	--	--	--	
407	5/3-7D1			70	120	21.3	36.6	lava, blue	Basalt	--	--	--	
407	5/3-7D1			120	130	36.6	39.6	rock, blue, hard	Ash or tuff	hard	--	--	
407	5/3-7D1			130	145	39.6	44.2	broken lava; water	Ash or tuff	--	--	--	
408	5/4-9D1	408	5/4-9D1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Tsv
408	5/4-9D1			3	63	0.9	19.2	tuff	Ash or tuff	--	--	--	
408	5/4-9D1			63	70	19.2	21.3	boulders and sand; water	Sand (or sandstone) and gravel	--	--	--	
408	5/4-9D1			70	93	21.3	28.3	boulders, cemented	Gravel	cemented	--	--	
408	5/4-9D1			93	98	28.3	29.9	lava, water	Basalt	--	--	--	
408	5/4-9D1			98	127	29.9	38.7	lava and cemented	Basalt	--	--	--	
408	5/4-9D1			127	135	38.7	41.1	lava, water	Basalt	--	--	--	
408	5/4-9D1			135	135	41.1	41.1	cement	Clay, sand, and gravel	cemented	--	--	
409	5/4-12E1	409	5/4-12E1	0	4	0.0	1.2	soil and boulders	Clay, sand, and gravel	--	--	--	Tsv
409	5/4-12E1			4	80	1.2	24.4	tuff, brown	Ash or tuff	--	--	--	
409	5/4-12E1			80	82	24.4	25.0	rock, broken, and water	Ash or tuff	hard	--	--	
409	5/4-12E1			82	167	25.0	50.9	rock	Ash or tuff	hard	--	--	
409	5/4-12E1			167	180	50.9	54.9	rock, hard	Ash or tuff	hard	--	--	
409	5/4-12E1			180	189	54.9	57.6	rock, broken; and water	Ash or tuff	hard	--	--	
409	5/4-12E1			189	255	57.6	77.7	tuff, blue	Ash or tuff	--	--	--	
410	5/3-7E3	410	5/3-7E3	0	186	0.0	56.7	no record	No data	--	--	--	Tsv
410	5/3-7E3			186	224	56.7	68.3	rocks	Ash or tuff	hard	--	--	
410	5/3-7E3			224	242	68.3	73.8	rocks, soft; water	Ash or tuff	hard	--	--	
410	5/3-7E3			242	270	73.8	82.3	clay, yellow	Clay	--	--	--	
410	5/3-7E3			270	278	82.3	84.7	rocks, blue soft; water	Sandstone	hard	--	--	
410	5/3-7E3			278	310	84.7	94.5	rocks, yellow	Ash or tuff	hard	--	--	
410	5/3-7E3			310	402	94.5	122.5	rocks, blue soft; water	Sandstone	hard	--	--	
410	5/3-7E3			402	429	122.5	130.8	cement	Clay, sand, and gravel	cemented	--	--	
410	5/3-7E3		429	431	130.8	131.4	conglomerate, soft; water	Clay, sand, and gravel	--	--	--		
410	5/3-7E3		431	444	131.4	135.3	lava, hard	Basalt	hard	--	--		
410	5/3-7E3		444	448	135.3	136.6	lava, brown, water	Basalt	--	--	--		
410	5/3-7E3		448	478	136.6	145.7	cement	Clay, sand, and gravel	cemented	--	--		
411	5/4-11E1	411	5/4-11E1	0	60	0.0	18.3	clay	Clay	--	--	--	Qyal and Qoal
411	5/4-11E1			60	160	18.3	48.8	boulders	Gravel	--	--	--	
411	5/4-11E1			160	170	48.8	51.8	shale	Clay and sand (or sandstone)	cemented	--	--	
411	5/4-11E1			170	210	51.8	64.0	sand	Sand	--	--	--	
411	5/4-11E1			210	360	64.0	109.7	clay, yellow; flow of water at 360 ft.	Clay	--	--	--	
411	5/4-11E1			360	450	109.7	137.2	shale, more water	Clay and sand (or sandstone)	cemented	--	--	Tsv (?)
411	5/4-11E1			450	500	137.2	152.4	shale	Clay and sand (or sandstone)	cemented	--	--	
411	5/4-11E1			500	700	152.4	213.4	shale, blue; warm water	Clay and sand (or sandstone)	cemented	--	--	
412	5/4-9E1	412	5/4-9E1	0	298	0.0	90.8	lava	Basalt	--	--	--	Tsv

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
412	5/4-9E1			298	310	90.8	94.5	open hole, water reached (probably tuffaceous quicksand)	No data	--	--	--	
412	5/4-9E1			310	380	94.5	115.8	sand, white, bailed 30-50 yds. clay, blue, water	Clay	--	--	--	
413	5/4-12J1	413	5/4-12J1	0	7	0.0	2.1	soil	Sand and clay	--	--	--	Qt
413	5/4-12J1			7	12	2.1	3.7	gravel, and clay, water	Clay and gravel	--	--	--	
413	5/4-12J1			12	82	3.7	25.0	clay	Clay	--	--	--	Tsv
413	5/4-12J1			82	111	25.0	33.8	tule clay	Clay and sand (or sandstone)	--	--	tule	
413	5/4-12J1			111	170	33.8	51.8	boulders, cemented	Gravel	cemented	--	--	
413	5/4-12J1			170	209	51.8	63.7	lava, cemented	Basalt	--	--	--	
413	5/4-12J1			209	258	63.7	78.6	lava, water	Basalt	--	--	--	
413	5/4-12J1			258	271	78.6	82.6	lava, cemented; some water	Basalt	--	--	--	
413	5/4-12J1			271	293	82.6	89.3	lava, water	Basalt	--	--	--	
413	5/4-12J1			293	303	89.3	92.4	lava, cemented	Basalt	--	--	--	
414	5/4-9K2	414	5/4-9K2	0	7	0.0	2.1	surface	Sand and clay	--	--	--	Qyal and Qoal
414	5/4-9K2			7	20	2.1	6.1	clay, yellow	Clay	--	--	--	
414	5/4-9K2			20	25	6.1	7.6	clay, yellow; and gravel water	Clay and gravel	--	--	--	
414	5/4-9K2			25	47	7.6	14.3	clay, yellow	Clay	--	--	--	
414	5/4-9K2			47	80	14.3	24.4	clay, yellow; good gravel water	Clay	--	--	--	
414	5/4-9K2			80	108	24.4	32.9	clay, yellow; some gravel	Clay and gravel	--	--	--	
415	5/4-11L3	415	5/4-11L3	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Qoal
415	5/4-11L3			2	10	0.6	3.0	clay, boulders	Clay and gravel	--	--	--	
415	5/4-11L3			10	28	3.0	8.5	sand and clay	Sand and clay	--	--	--	
415	5/4-11L3			28	31	8.5	9.4	clay, sandy; and boulders	Clay, sand, and gravel	--	--	--	
415	5/4-11L3			31	50	9.4	15.2	dry sand and gravel	Sand (or sandstone) and gravel	--	--	--	
415	5/4-11L3			50	67	15.2	20.4	gravel and water	Gravel	--	--	--	
415	5/4-11L3			67	69	20.4	21.0	lava rock and mud	Basalt	hard	--	--	Tsv
416	5/4-9L1	416	5/4-9L1	0	64	0.0	19.5	soil and clay	Sand and clay	--	--	--	Tsv
416	5/4-9L1			64	66	19.5	20.1	gravel, some water	Gravel	--	--	--	
416	5/4-9L1			66	105	20.1	32.0	clay and boulders	Clay and gravel	--	--	--	
416	5/4-9L1			105	108	32.0	32.9	gravel, no water, lost some water	Gravel	--	--	--	
416	5/4-9L1			108	175	32.9	53.3	clay	Clay	--	--	--	
416	5/4-9L1	417	5/4-9Q1	175	200	53.3	61.0	clay, gravel	Clay and gravel	--	--	--	
416	5/4-9L1			200	220	61.0	67.1	clay	Clay	--	--	--	
416	5/4-9L1			220	240	67.1	73.2	clay, gravel, some water	Clay and gravel	--	--	--	
416	5/4-9L1			240	258	73.2	78.6	clay	Clay	--	--	--	
417	5/4-9Q1		5/4-9Q1	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Qoal
417	5/4-9Q1			2	65	0.6	19.8	clay, yellow	Clay	--	--	--	
417	5/4-9Q1			65	66	19.8	20.1	gravel, water	Gravel	--	--	--	
417	5/4-9Q1			66	170	20.1	51.8	clay, yellow	Clay	--	--	--	
417	5/4-9Q1			170	172	51.8	52.4	gravel, water	Gravel	--	--	--	
417	5/4-9Q1			172	178	52.4	54.3	clay, yellow	Clay	--	--	--	
418	5/4-10P4	418	5/4-10P4	0	37	0.0	11.3	clay	Clay	--	--	--	Qyal and Qoal
418	5/4-10P4			37	75	11.3	22.9	clay, blue	Clay	--	--	--	
418	5/4-10P4			75	86	22.9	26.2	gravel	Gravel	--	--	--	
418	5/4-10P4			86	96	26.2	29.3	clay and gravel	Clay and gravel	--	--	--	
418	5/4-10P4			96	106	29.3	32.3	clay	Clay	--	--	--	
418	5/4-10P4			106	116	32.3	35.4	clay and gravel	Clay and gravel	--	--	--	
418	5/4-10P4			116	162	35.4	49.4	clay	Clay	--	--	--	
418	5/4-10P4			162	194	49.4	59.1	gravel	Gravel	--	--	--	
418	5/4-10P4			194	228	59.1	69.5	clay	Clay	--	--	--	
418	5/4-10P4			228	241	69.5	73.5	gravel	Gravel	--	--	--	
418	5/4-10P4	419	5/4-10C1	241	247	73.5	75.3	clay and gravel	Clay and gravel	--	--	--	
418	5/4-10P4			247	254	75.3	77.4	gravel	Gravel	--	--	--	
418	5/4-10P4			254	300	77.4	91.4	clay	Clay	--	--	--	
419	5/4-14C1		5/4-14C1	0	6	0.0	1.8	surface	Sand and clay	--	--	--	Qoal
419	5/4-14C1			6	55	1.8	16.8	clay, yellow	Clay	--	--	--	
419	5/4-14C1			55	70	16.8	21.3	gravel and boulders; water	Gravel	--	--	--	
419	5/4-14C1			70	180	21.3	54.9	clay, yellow	Clay	--	--	--	
419	5/4-14C1			180	190	54.9	57.9	gravel and boulders; water	Gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
419	5/4-14C1			190	220	57.9	67.1	clay and boulders, yellow; some water	Clay and gravel	--	--	--	
420	5/4-15C2	420	5/4-15C2	0	60	0.0	18.3	old well, material not described	No data	--	--	--	--
420	5/4-15C2			60	82	18.3	25.0	clay and some gravel	Clay and gravel	--	--	--	Qoal
420	5/4-15C2			82	86.6	25.0	26.4	clay, blue, gravel at bottom; salty water	Clay	--	--	--	
421	5/3-17C1	421	5/3-17C1	0	84	0.0	25.6	tuff	Ash or tuff	--	--	--	Tsv
421	5/3-17C1			84	105	25.6	32.0	rock, hard	Ash or tuff	hard	--	--	
421	5/3-17C1			105	185	32.0	56.4	tuff	Ash or tuff	--	--	--	
421	5/3-17C1			185	210	56.4	64.0	lava, brown; some water	Basalt	--	--	--	
421	5/3-17C1			210	237	64.0	72.2	tuff, blue	Ash or tuff	--	--	--	
421	5/3-17C1			237	261	72.2	79.6	lava, broken; water	Basalt	--	--	--	
422	5/4-13E1	422	5/4-13E1	0	9	0.0	2.7	soil	Sand and clay	--	--	--	Qoal
422	5/4-13E1			9	30	2.7	9.1	hardpan	Clay and gravel	hard	--	--	
422	5/4-13E1			30	35	9.1	10.7	gravel water	Gravel	--	--	--	
422	5/4-13E1			35	48	10.7	14.6	hardpan	Clay and gravel	hard	--	--	
422	5/4-13E1			48	65	14.6	19.8	clay, blue	Clay	--	--	--	
422	5/4-13E1			65	140	19.8	42.7	clay, blue shale	Clay and sand (or sandstone)	cemented	--	--	
422	5/4-13E1			140	148	42.7	45.1	gravel, some water	Gravel	--	--	--	
422	5/4-13E1			148	153	45.1	46.6	shale	Clay and sand (or sandstone)	cemented	--	--	Tsv
423	5/4-14H3	423	5/4-14H3	0	10	0.0	3.0	soil	Sand and clay	--	--	--	Qoal
423	5/4-14H3			10	54	3.0	16.5	clay, yellow	Clay	--	--	--	
423	5/4-14H3			54	55	16.5	16.8	gravel, water	Gravel	--	--	--	
423	5/4-14H3			55	81	16.8	24.7	clay	Clay	--	--	--	
423	5/4-14H3			81	87	24.7	26.5	gravel, water	Gravel	--	--	--	
423	5/4-14H3			87	102	26.5	31.1	clay and boulders	Clay and gravel	--	--	--	
423	5/4-14H3			102	109	31.1	33.2	boulders, clay and shale	Clay, sand, and gravel	cemented	--	--	
423	5/4-14H3			109	240	33.2	73.2	gravel, sand, water	Sand (or sandstone) and gravel	--	--	--	
424	5/4-17F1	424	5/4-17F1	0	160	0.0	48.8	shale, blue, salty water	Clay and sand (or sandstone)	cemented	--	--	Capay shale
425	5/4-13L1	425	5/4-13L1	0	49	0.0	14.9	containing gravel	Clay, sand, and gravel	--	--	--	Qoal
425	5/4-13L1			49	83	14.9	25.3	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
425	5/4-13L1							clay, black, slightly sand and containing a large percent of vegetable matter					
425	5/4-13L1			83	100	25.3	30.5	vegetable matter	Clay and sand (or sandstone)	--	--	plants	
425	5/4-13L1			100	125	30.5	38.1	clay, blue, sandy	Clay and sand (or sandstone)	--	--	--	
425	5/4-13L1			125	215	38.1	65.5	tuff	Ash or tuff	--	--	--	Tsv
425	5/4-13L1			215	260	65.5	79.2	tuff, chiefly fine white ash	Ash or tuff	--	--	--	
425	5/4-13L1			260	265	79.2	80.8	and basalt	Ash or tuff	--	--	--	
425	5/4-13L1			265	270	80.8	82.3	tuff	Ash or tuff	--	--	--	
425	5/4-13L1			270	370	82.3	112.8	tuff, chiefly pumice	Ash or tuff	--	--	--	
425	5/4-13L1			370	375	112.8	114.3	tule	Clay and sand (or sandstone)	--	--	tule	
425	5/4-13L1			375	390	114.3	118.9	tuff	Ash or tuff	--	--	--	
425	5/4-13L1			390	401	118.9	122.2	basalt	Basalt	--	--	--	
425	5/4-13L1			401	406	122.2	123.7	clay, blue	Clay	--	--	--	
425	5/4-13L1			406	420	123.7	128.0	tuff, brown	Ash or tuff	--	--	--	
425	5/4-13L1			420	425	128.0	129.5	clay, blue, sticky	Clay	--	--	--	
425	5/4-13L1			425	430	129.5	131.1	tuff, brown	Ash or tuff	--	--	--	
425	5/4-13L1			430	432	131.1	131.7	basalt	Basalt	--	--	--	
425	5/4-13L1			432	438	131.7	133.5	clay, brown, soft	Clay	--	--	--	
425	5/4-13L1			438	440	133.5	134.1	basalt, very hard	Basalt	hard	--	--	
425	5/4-13L1			440	445	134.1	135.6	ash	Ash or tuff	--	--	--	
425	5/4-13L1			445	450	135.6	137.2	clay, blue, sticky	Clay	--	--	--	
425	5/4-13L1			450	455	137.2	138.7	tuff, brown	Ash or tuff	--	--	--	
425	5/4-13L1			455	472	138.7	143.9	clay and rock	Clay and gravel	--	--	--	
425	5/4-13L1			472	475	143.9	144.8	basalt	Basalt	--	--	--	
425	5/4-13L1			475	485	144.8	147.8	basalt, porous	Basalt	--	--	--	
425	5/4-13L1			485	500	147.8	152.4	clay, blue, sickly	Clay	--	--	--	
425	5/4-13L1			500	510	152.4	155.4	basalt and lava	Basalt	--	--	--	
425	5/4-13L1			510	518	155.4	157.9	clay, blue, sticky	Clay	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
425	5/4-13L1			518	520	157.9	158.5	basalt	Basalt	--	--	--	
425	5/4-13L1				520	522	158.5	159.1	clay, sticky	Clay	--	--	--
425	5/4-13L1				522	525	159.1	160.0	basalt and lava	Basalt	--	--	--
425	5/4-13L1				525	530	160.0	161.5	basalt and pink lava	Basalt	--	--	--
425	5/4-13L1				530	535	161.5	163.1	clay, sticky	Clay	--	--	--
425	5/4-13L1				535	537	163.1	163.7	basalt and lava	Basalt	--	--	--
425	5/4-13L1				537	539	163.7	164.3	clay, sticky	Clay	--	--	--
425	5/4-13L1				539	545	164.3	166.1	basalt and lava	Basalt	--	--	--
425	5/4-13L1				545	555	166.1	169.2	basalt and lava, pink	Basalt	--	--	--
425	5/4-13L1				555	568	169.2	173.1	basalt and lava, black	Basalt	--	--	--
425	5/4-13L1				568	570	173.1	173.7	sand and lava	Sand (or sandstone) and gravel	--	--	--
425	5/4-13L1				570	580	173.7	176.8	tuff and lava	Ash or tuff	--	--	--
425	5/4-13L1				580	585	176.8	178.3	tuff and lava, red	Ash or tuff	--	--	--
425	5/4-13L1				585	610	178.3	185.9	tuff and lava, blue	Ash or tuff	--	--	--
425	5/4-13L1				610	615	185.9	187.5	lava and sandy	Basalt	--	--	--
425	5/4-13L1				615	620	187.5	189.0	tuff, red and yellow	Ash or tuff	--	--	--
425	5/4-13L1				620	640	189.0	195.1	basalt and lava, black	Basalt	--	--	--
425	5/4-13L1				640	650	195.1	198.1	tuff, black	Ash or tuff	--	--	--
425	5/4-13L1				650	670	198.1	204.2	tuff, and black sand	Ash or tuff	--	--	--
425	5/4-13L1				670	675	204.2	205.7	clay, sticky, some rock	Clay and gravel	--	--	--
425	5/4-13L1				675	680	205.7	207.3	tuff and sand	Ash or tuff	--	--	--
425	5/4-13L1				680	690	207.3	210.3	sand, black	Sand	--	--	--
425	5/4-13L1				690	695	210.3	211.8	tuff, and gray sand	Ash or tuff	--	--	--
425	5/4-13L1				695	700	211.8	213.4	tuff, various colors	Ash or tuff	--	--	--
425	5/4-13L1				700	705	213.4	214.9	tuff and lava	Ash or tuff	--	--	--
425	5/4-13L1				705	720	214.9	219.5	tuff and sand	Ash or tuff	--	--	--
425	5/4-13L1				720	733	219.5	223.4	basalt	Basalt	--	--	--
425	5/4-13L1				733	736	223.4	224.3	lava	Basalt	--	--	--
425	5/4-13L1				736	742	224.3	226.2	basalt	Basalt	--	--	--
425	5/4-13L1				742	746	226.2	227.4	lava and sandy	Basalt	--	--	--
425	5/4-13L1				746	750	227.4	228.6	basalt	Basalt	--	--	--
425	5/4-13L1				750	765	228.6	233.2	tuff, blue	Ash or tuff	--	--	--
425	5/4-13L1				765	770	233.2	234.7	sand, gray	Sand	--	--	--
425	5/4-13L1				770	779	234.7	237.4	sand and lava, various colors	Sand (or sandstone) and gravel	--	--	--
425	5/4-13L1				779	785	237.4	239.3	tuff and lava	Ash or tuff	--	--	--
425	5/4-13L1				785	792	239.3	241.4	tuff and basalt	Ash or tuff	--	--	--
425	5/4-13L1				792	796	241.4	242.6	basalt	Basalt	--	--	--
425	5/4-13L1				796	816	242.6	248.7	basalt, very hard	Basalt	hard	--	--
425	5/4-13L1				816	821	248.7	250.2	basalt	Basalt	--	--	--
425	5/4-13L1				821	822	250.2	250.5	basalt, very hard	Basalt	hard	--	--
425	5/4-13L1				822	824	250.5	251.2	basalt	Basalt	--	--	--
425	5/4-13L1				824	826	251.2	251.8	basalt, very hard	Basalt	hard	--	--
425	5/4-13L1				826	835	251.8	254.5	basalt	Basalt	--	--	--
425	5/4-13L1				835	860	254.5	262.1	basalt, very hard	Basalt	hard	--	--
425	5/4-13L1				860	865	262.1	263.7	basalt, soft	Basalt	--	--	--
425	5/4-13L1				865	869	263.7	264.9	basalt, black and hard	Basalt	hard	--	--
425	5/4-13L1				869	875	264.9	266.7	basalt, soft and pink	Basalt	--	--	--
425	5/4-13L1				875	878	266.7	267.6	basalt, hard	Basalt	hard	--	--
425	5/4-13L1				878	886	267.6	270.1	basalt, soft and pink	Basalt	--	--	--
425	5/4-13L1				886	895	270.1	272.8	basalt, very hard	Basalt	hard	--	--
425	5/4-13L1				895	904	272.8	275.5	basalt, hard	Basalt	hard	--	--
426	5/4-14L2	426	5/4-14L2	0	56	0.0	17.1	gravel and clay	Clay and gravel	--	--	--	Qoal
426	5/4-14L2			56	80	17.1	24.4	clay, yellow	Clay	--	--	--	
426	5/4-14L2			80	85	24.4	25.9	gravel, flowing water	Gravel	--	--	--	
426	5/4-14L2			85	105	25.9	32.0	tule mud	Clay and sand (or sandstone)	--	--	tule	
426	5/4-14L2			105	255	32.0	77.7	volcanic ash compact	Ash or tuff	--	--	--	Tsv
								volcanic rock and sands gradual increase in water from 225 to 323 ft.					
426	5/4-14L2			255	323	77.7	98.5		Ash or tuff	--	--	--	
426	5/4-14L2			323	325	98.5	99.1	basalt rock	Basalt	hard	--	--	
427	5/4-14L1	427	5/4-14L1	0	5	0.0	1.5	surface	Sand and clay	--	--	--	Qoal

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
427	5/4-14L1			5	30	1.5	9.1	clay, yellow	Clay	--	--	--	
427	5/4-14L1			30	43	9.1	13.1	gravel	Gravel	--	--	--	
427	5/4-14L1			43	50	13.1	15.2	clay, yellow	Clay	--	--	--	
427	5/4-14L1			50	97	15.2	29.6	clay, blue; gravel; and boulders	Clay and gravel	--	--	--	
427	5/4-14L1			97	130	29.6	39.6	tule mud	Clay and sand (or sandstone)	--	--	tule	Tsv
427	5/4-14L1			130	175	39.6	53.3	clay, blue	Clay	--	--	--	
427	5/4-14L1			175	180	53.3	54.9	tuff, brown, soft	Ash or tuff	--	--	--	
427	5/4-14L1			180	200	54.9	61.0	tuff, hard, gray	Ash or tuff	hard	--	--	
427	5/4-14L1			200	215	61.0	65.5	tuff	Ash or tuff	--	--	--	
427	5/4-14L1			215	263	65.5	80.2	volcanic ash	Ash or tuff	--	--	--	
427	5/4-14L1			263	325	80.2	99.1	conglomerate, basaltic	Basalt	--	--	--	
427	5/4-14L1			325	350	99.1	106.7	basalt, hard	Basalt	hard	--	--	
427	5/4-14L1			350	354	106.7	107.9	clay, blue rock	Clay and gravel	--	--	--	
427	5/4-14L1			354	369	107.9	112.5	basalt and clay	Basalt	--	--	--	
427	5/4-14L1			369	382	112.5	116.4	clay blue	Clay	--	--	--	
427	5/4-14L1			382	433	116.4	132.0	basalt and clay	Basalt	--	--	--	
427	5/4-14L1			433	438	132.0	133.5	basalt, hard	Basalt	hard	--	--	
427	5/4-14L1			438	440	133.5	134.1	clay	Clay	--	--	--	
427	5/4-14L1			440	465	134.1	141.7	basalt, hard	Basalt	hard	--	--	
427	5/4-14L1			465	488	141.7	148.7	clay, hard, and rock	Clay and gravel	hard	--	--	
427	5/4-14L1			488	492	148.7	150.0	clay	Clay	--	--	--	
427	5/4-14L1			492	502	150.0	153.0	lava, red; water	Basalt	--	--	--	
427	5/4-14L1			502	520	153.0	158.5	clay and rock	Clay and gravel	--	--	--	
427	5/4-14L1			520	525	158.5	160.0	basalt, hard; and clay	Basalt	hard	--	--	
428	5/4-15K1	428	5/4-15K1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qyal and Qoal
428	5/4-15K1			3	12	0.9	3.7	clay, yellow	Clay	--	--	--	
428	5/4-15K1			12	13	3.7	4.0	sand, water	Sand	--	--	--	
428	5/4-15K1			13	20	4.0	6.1	clay, yellow	Clay	--	--	--	
428	5/4-15K1			20	28	6.1	8.5	sand and gravel	Sand (or sandstone) and gravel	--	--	--	
428	5/4-15K1			28	35	8.5	10.7	gravel and clay	Clay and gravel	--	--	--	
428	5/4-15K1			35	41	10.7	12.5	sand, blue; and clay	Sand and clay	--	--	--	
428	5/4-15K1			41	70	12.5	21.3	clay, blue	Clay	--	--	--	
428	5/4-15K1			70	101	21.3	30.8	clay, yellow	Clay	--	--	--	
428	5/4-15K1			101	105	30.8	32.0	clay and sand, yellow	Clay and sand (or sandstone)	--	--	--	
428	5/4-15K1			105	118	32.0	36.0	clay and sand	Clay and sand (or sandstone)	--	--	--	
428	5/4-15K1			118	191	36.0	58.2	clay, yellow	Clay	--	--	--	
428	5/4-15K1			191	195	58.2	59.4	gravel	Gravel	--	--	--	
428	5/4-15K1			195	205	59.4	62.5	clay, yellow	Clay	--	--	--	
428	5/4-15K1			205	227	62.5	69.2	clay, white	Clay	--	--	--	
428	5/4-15K1			227	238	69.2	72.5	gravel strips	Gravel	--	--	--	
428	5/4-15K1			238	252	72.5	76.8	clay, yellow	Clay	--	--	--	
428	5/4-15K1			252	276	76.8	84.1	sand and gravel, blue	Sand (or sandstone) and gravel	--	--	--	
428	5/4-15K1			276	282	84.1	86.0	clay, blue	Clay	--	--	--	
428	5/4-15K1			282	298	86.0	90.8	boulders	Gravel	--	--	--	
428	5/4-15K1			298	327	90.8	99.7	clay, blue	Clay	--	--	--	
428	5/4-15K1			327	328	99.7	100.0	boulders	Gravel	--	--	--	
428	5/4-15K1			328	340	100.0	103.6	clay, blue	Clay	--	--	--	
428	5/4-15K1			340	510	103.6	155.4	tule	Clay and sand (or sandstone)	--	--	tule	
428	5/4-15K1			510	580	155.4	176.8	tule mud	Clay and sand (or sandstone)	--	--	tule	
428	5/4-15K1			580	658	176.8	200.6	sand, blue	Sand	--	--	--	
428	5/4-15K1			658	677	200.6	206.3	rock, soft, blue	Sandstone	hard	--	--	
428	5/4-15K1			677	791	206.3	241.1	clay, blue	Clay	--	--	--	
428	5/4-15K1			791	802	241.1	244.4	shale, possibly andesite	Ash or tuff	cemented	--	--	Tsv (?)
428	5/4-15K1			802	869	244.4	264.9	shale, brown	Ash or tuff	cemented	--	--	
428	5/4-15K1			869	891	264.9	271.6	tule mud	Ash or tuff	--	--	tule	
428	5/4-15K1			891	892	271.6	271.9	serpentine	Basalt	--	--	--	
428	5/4-15K1			892	903	271.9	275.2	tule mud	Ash or tuff	--	--	tule	
428	5/4-15K1			903	910	275.2	277.4	boulders	Ash or tuff	--	--	--	
428	5/4-15K1			910	918	277.4	279.8	shale brown	Ash or tuff	cemented	--	--	
428	5/4-15K1			918	940	279.8	286.5	clay, blue	Ash or tuff	--	--	--	
428	5/4-15K1			940	950	286.5	289.6	tule mud	Ash or tuff	--	--	tule	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>	
428	5/4-15K1			950	957	289.6	291.7	rock	Ash or tuff	hard	--	--		
428	5/4-15K1			957	980	291.7	298.7	rock and clay	Ash or tuff	--	--	--		
428	5/4-15K1			980	984	298.7	299.9	rock, black	Basalt	hard	--	--		
428	5/4-15K1			984	1030	299.9	313.9	conglomerate, grayish blue	Basalt	--	--	--		
428	5/4-15K1			1030	1036	313.9	315.8	rock, hard	Basalt	hard	--	--		
428	5/4-15K1			1036	1045	315.8	318.5	sand and gravel	Basalt	--	--	--		
428	5/4-15K1			1045	1070	318.5	326.1	rock, loose	Basalt	--	--	--		
428	5/4-15K1							sandstone, gray and boulders,						
428	5/4-15K1			1070	1090	326.1	332.2	black	Basalt	cemented	--	--		
428	5/4-15K1			1090	1152	332.2	351.1	rock, volcanic gray	Basalt	hard	--	--		
428	5/4-15K1			1152	1168	351.1	356.0	rock, black	Basalt	hard	--	--		
429	5/4-14P1	429	5/4-14P1	0	5	0.0	1.5	surface	Sand and clay	--	--	--	Qyal	
429	5/4-14P1			5	40	1.5	12.2	sand and gravel water	Sand (or sandstone) and gravel	--	--	--		
429	5/4-14P1			40	60	12.2	18.3	clay, blue and sand	Clay and sand (or sandstone)	--	--	--	Qoal	
429	5/4-14P1			60	75	18.3	22.9	boulders	Gravel	--	--	--		
429	5/4-14P1			75	100	22.9	30.5	clay blue	Clay	--	--	--		
429	5/4-14P1			100	108	30.5	32.9	boulders	Gravel	--	--	--		
429	5/4-14P1			108	130	32.9	39.6	clay, gray	Clay	--	--	--		
429	5/4-14P1			130	160	39.6	48.8	clay, blue, with boulders	Clay and gravel	--	--	--		
429	5/4-14P1			160	165	48.8	50.3	clay, hard, gray	Clay	hard	--	--		
429	5/4-14P1			165	268	50.3	81.7	clay, blue, with boulders	Clay and gravel	--	--	--		
429	5/4-14P1			268	274	81.7	83.5	boulders	Gravel	--	--	--		
429	5/4-14P1			274	290	83.5	88.4	clay, blue, with boulders	Clay and gravel	--	--	--		
429	5/4-14P1			290	310	88.4	94.5	conglomerate, basaltic	Basalt	--	--	--		
429	5/4-14P1			310	365	94.5	111.3	clay, blue with boulders	Clay and gravel	--	--	--		
429	5/4-14P1			365	385	111.3	117.3	boulders	Gravel	--	--	--		
429	5/4-14P1			385	500	117.3	152.4	lava rock	Basalt	hard	--	--	Tsv	
429	5/4-14P1			500	600	152.4	182.9	basalt rock	Basalt	hard	--	--		
430	5/4-15P2	430	5/4-15P2	0	25	0.0	7.6	clay, yellow	Clay	--	--	--	Qyal and Qoal	
430	5/4-15P2			25	90	7.6	27.4	clay, boulders	Clay and gravel	--	--	--		
430	5/4-15P2			90	105	27.4	32.0	gravel, salty water	Gravel	--	--	--		
430	5/4-15P2			105	295	32.0	89.9	clay, yellow; boulders	Clay and gravel	--	--	--		
430	5/4-15P2			295	350	89.9	106.7	tule mud, driftwood	Clay and sand (or sandstone)	--	--	tule, wood		
430	5/4-15P2			350	370	106.7	112.8	clay, blue	Clay	--	--	--		
430	5/4-15P2			370	600	112.8	182.9	clay and boulders, yellow	Clay and gravel	--	--	--		
430	5/4-15P2			600	750	182.9	228.6	rock	Ash or tuff	hard	--	--	Tsv	
430	5/4-15P2			750	860	228.6	262.1	clay and boulders, yellow	Clay and gravel	--	--	--		
430	5/4-15P2			860	990	262.1	301.8	volcanic ash	Ash or tuff	--	--	--		
430	5/4-15P2			990	1010	301.8	307.8	gravel, cement, some water	Gravel	cemented	--	--		
430	5/4-15P2			1010	1195	307.8	364.2	ash, brown	Ash or tuff	--	--	--		
430	5/4-15P2			1195	1214	364.2	370.0	rock, broken; water	Ash or tuff	hard	--	--		
431	5/4-21A1	431	5/4-21A1	0	4	0.0	1.2	surface	Sand and clay	--	--	--	Qoal	
431	5/4-21A1			4	30	1.2	9.1	boulders	Gravel	--	--	--		
431	5/4-21A1			30	57	9.1	17.4	clay, red	Clay	--	--	--	Tsv	
431	5/4-21A1			57	75	17.4	22.9	clay, red; some sand and gravel	Clay, sand, and gravel	--	--	--		
431	5/4-21A1			75	95	22.9	29.0	boulders	Gravel	--	--	--		
431	5/4-21A1			95	130	29.0	39.6	clay and sand, gray	Clay and sand (or sandstone)	--	--	--		
431	5/4-21A1			130	207	39.6	63.1	clay, blue some sand	Clay and sand (or sandstone)	--	--	--		
431	5/4-21A1			207	225	63.1	68.6	boulders	Gravel	--	--	--		
431	5/4-21A1			225	240	68.6	73.2	clay, sand; some sand	Clay and sand (or sandstone)	--	--	--		
431	5/4-21A1			240	300	73.2	91.4	clay and boulders, blue	Clay and gravel	--	--	--		
431	5/4-21A1			300	330	91.4	100.6	clay, sandy blue	Clay and sand (or sandstone)	--	--	--		
431	5/4-21A1			330	390	100.6	118.9	basalt, shattered	Basalt	--	--	--		
431	5/4-21A1			390	450	118.9	137.2	lava ash, brown and basalt	Basalt	--	--	--		
431	5/4-21A1			450	545	137.2	166.1	basalt	Basalt	--	--	--		
432	5/4-19J1	432	5/4-19J1	0	12	0.0	3.7	soil	Sand and clay	--	--	--	Qt	
432	5/4-19J1			12	100	3.7	30.5	Markley sandstone, water	Sandstone	cemented	--	--	Markley sandstone	
433	5/4-19J2		433	5/4-19J2	0	18	0.0	5.5	clay, blue	Clay	--	--	Qt	
433	5/4-19J2			18	59	5.5	18.0	Markley sandstone, blue	Sandstone	cemented	--	--	Markley sandstone	
433	5/4-19J2			59	63	18.0	19.2	rock, broken; water	Sandstone	hard	--	--		
433	5/4-19J2			63	90	19.2	27.4	sandstone, blue	Sandstone	cemented	--	--		

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
433	5/4-19J2			90	93	27.4	28.3	sandstone, broken; water	Sandstone	cemented	--	--	
433	5/4-19J2			93	108	28.3	32.9	sandstone	Sandstone	cemented	--	--	
434	5/4-21P2	434	5/4-21P2	0	235	0.0	71.6	shale, black	Clay and sand (or sandstone)	cemented	--	--	Qt
435	5/4-19R1	435	5/4-19R1	0	18	0.0	5.5	soil	Sand and clay	--	--	--	Qt
435	5/4-19R1			18	135	5.5	41.1	Monterey shale, black, thin-bedded	Clay and sand (or sandstone)	cemented	--	--	Monterey shale (?)
436	5/4-19Q1	436	5/4-19Q1	0	45	0.0	13.7	silt black	Clay and sand (or sandstone)	--	--	--	Qyal
436	5/4-19Q1			45	175	13.7	53.3	clay, yellow	Clay	--	--	--	Qh
437	5/4-27A1	437	5/4-27A1	0	10	0.0	3.0	soil and gravel	Sand (or sandstone) and gravel	--	--	--	Qoal
437	5/4-27A1			10	12	3.0	3.7	gravel in yellow clay	Clay and gravel	--	--	--	
437	5/4-27A1			12	30	3.7	9.1	soft sandstone, yellow, changing to sandy yellow clay	Sandstone	cemented	--	--	
437	5/4-27A1			30	53	9.1	16.2	stiff clay, yellow with gravel	Clay and gravel	--	--	--	
437	5/4-27A1			53	59	16.2	18.0	sandy clay, blue with gravel	Clay, sand, and gravel	--	--	--	
437	5/4-27A1			59	87	18.0	26.5	dark stiff clay	Clay	--	--	--	
437	5/4-27A1			87	95	26.5	29.0	blue sand with clay	Sand and clay	--	--	--	
437	5/4-27A1			95	102	29.0	31.1	gravel, blue, water-worn	Gravel	--	--	--	
437	5/4-27A1			102	130	31.1	39.6	sand, blue, with clay	Sand and clay	--	--	--	
437	5/4-27A1			130	188	39.6	57.3	volcanic tuff	Ash or tuff	--	--	--	Tsv
437	5/4-27A1			188	194	57.3	59.1	very hard tuff or shale	Clay and sand (or sandstone)	hard	--	--	
437	5/4-27A1			194	204	59.1	62.2	blue gray clay with sand and sharp gravel	Clay, sand, and gravel	--	--	--	
437	5/4-27A1			204	242	62.2	73.8	dark clay	Clay	--	--	--	
437	5/4-27A1			242	252	73.8	76.8	brown sandy clay	Clay and sand (or sandstone)	--	--	--	
437	5/4-27A1			252	255	76.8	77.7	blue clay	Clay	--	--	--	
437	5/4-27A1			255	323	77.7	98.5	brown clay	Clay	--	--	--	
437	5/4-27A1			323	332	98.5	101.2	gravel and sand	Sand (or sandstone) and gravel	--	--	--	
437	5/4-27A1			332	335	101.2	102.1	volcanic tuff	Ash or tuff	--	--	--	
437	5/4-27A1							gravel, blue' sand and clay with light green lava. Water seeping over top	Clay, sand, and gravel	--	--	--	
437	5/4-27A1			335	435	102.1	132.6	Clay, blue and sand	Clay and sand (or sandstone)	--	--	--	
437	5/4-27A1			435	442	132.6	134.7	mud, brown; and sand. Flow of water	Clay and sand (or sandstone)	--	--	--	
437	5/4-27A1			442	475	134.7	144.8	water 5 gpm	Clay and sand (or sandstone)	--	--	--	
437	5/4-27A1			475	492	144.8	150.0	sand and gravel. Flow of water	Sand (or sandstone) and gravel	--	--	--	
437	5/4-27A1			492	504	150.0	153.6	12 gpm	Ash or tuff	--	--	--	
437	5/4-27A1			504	522	153.6	159.1	volcanic tuff	Ash or tuff	--	--	--	
437	5/4-27A1			522	532	159.1	162.2	brown ash and cinders	Ash or tuff	--	--	--	
437	5/4-27A1			532	542	162.2	165.2	porous dark cinders	Basalt	--	--	--	
437	5/4-27A1			542	570	165.2	173.7	cinders, brick red. Flow of water	Basalt	--	--	--	
437	5/4-27A1			570	630	173.7	192.0	50 gpm	Ash or tuff	--	--	--	
437	5/4-27A1			630	772	192.0	235.3	tuff and volcanic cinders	Basalt	--	--	--	
437	5/4-27A1			772	795	235.3	242.3	hard lava	Ash or tuff	--	--	--	
438	5/4-30B2	438	5/4-30B2	0	42	0.0	12.8	tuff and lava rock	Basalt	--	--	--	
438	5/4-30B2			42	196	12.8	59.7	50 gpm	Basalt	--	--	--	
438	5/4-30B2			196	530	59.7	161.5	clay, yellow	Clay	--	--	--	Qyal
438	5/4-30B2			530	570	161.5	173.7	rock, grayish-yellow	Ash or tuff	--	--	--	Qh
439	5/4-26B1	439	5/4-26B1	0	380	0.0	115.8	Neroly sandstone, flow of water	Sandstone	cemented	--	--	Tsv (?)
439	5/4-26B1							no record	No data	--	--	--	Neroly sandstone
439	5/4-26B1			380	380	115.8	115.8	basalt, gray, slightly vesicular and amygdaloidal, finely porphyritic	Basalt	--	--	--	Tsv
439	5/4-26B1			380	385	115.8	117.3	basalt, gray, fine-grained	Basalt	--	--	--	
439	5/4-26B1			385	390	117.3	118.9	basalt, gray, some red	Basalt	--	--	--	
439	5/4-26B1			390	393	118.9	119.8	basalt, slightly oxidized, vesicular	Basalt	--	--	--	
439	5/4-26B1			393	395	119.8	120.4	basalt, gray, vesicular	Basalt	--	--	--	
439	5/4-26B1			395	405	120.4	123.4	basalt, red, vesicular; some gray	Basalt	--	--	--	
439	5/4-26B1							vesicular basalt	Basalt	--	--	--	

**Appendix 3.** Lithologic data.—Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
439	5/4-26B1			405	420	123.4	128.0	basalt, mixed red and gray vesicular	Basalt	--	--	--	
439	5/4-26B1			420	435	128.0	132.6	basalt, light gray, fine-grained fragments of vesicular basalt;	Basalt	--	--	--	
439	5/4-26B1			435	438	132.6	133.5	some oxidized	Basalt	--	--	--	
439	5/4-26B1			438	485	133.5	147.8	basalt, gray, fine-grained	Basalt	--	--	--	
439	5/4-26B1			485	492	147.8	150.0	basalt, slightly oxidized, vesicular	Basalt	--	--	--	
439	5/4-26B1			492	495	150.0	150.9	basalt, red, vesicular	Basalt	--	--	--	
439	5/4-26B1			495	505	150.9	153.9	basalt, reddish-brown, vesicular and amygdaloidal; some pyrite	Basalt	--	--	--	
439	5/4-26B1			505	515	153.9	157.0	basalt, dark gray, vesicular; slightly amygdaloidal	Basalt	--	--	--	
439	5/4-26B1			515	525	157.0	160.0	basalt, dark gray, fine-grained, fairly porphyritic	Basalt	--	--	--	
439	5/4-26B1			525	530	160.0	161.5	basalt, mixed oxidized and unoxidized, vesicular and amygdaloidal	Basalt	--	--	--	
439	5/4-26B1			530	540	161.5	164.6	basalt, slightly vesicular and amygdaloidal	Basalt	--	--	--	
439	5/4-26B1			540	555	164.6	169.2	basalt, dark gray, slightly vesicular and amygdaloidal finely porphyritic with glassy texture. Basalt, dark gray, some red which might be cave	Basalt	--	--	--	
439	5/4-26B1			555	565	169.2	172.2	basalt, dark gray, slightly porphyritic and amygdaloidal	Basalt	--	--	--	
439	5/4-26B1			565	570	172.2	173.7	basalt, mixed gray and brown	Basalt	--	--	--	
439	5/4-26B1			570	580	173.7	176.8	vesicular basalt	Basalt	--	--	--	
439	5/4-26B1			580	585	176.8	178.3	basalt, mixed gray and reddish-brown, vesicular	Basalt	--	--	--	
439	5/4-26B1			585	590	178.3	179.8	basalt, dark gray, slightly vesicular	Basalt	--	--	--	
439	5/4-26B1			590	595	179.8	181.4	and amygdaloidal	Basalt	--	--	--	
439	5/4-26B1			595	597	181.4	182.0	basalt, gray, slightly vesicular and amygdaloidal, finely porphyritic	Basalt	--	--	--	
439	5/4-26B1			597	600	182.0	182.9	basaltic agglomerate vesicular	Basalt	--	--	--	
439	5/4-26B1			600	605	182.9	184.4	basalt, slightly oxidized, vesicular; some pyrite	Basalt	--	--	--	
439	5/4-26B1			605	615	184.4	187.5	basalt, gray, slightly amygdaloidal and vesicular	Basalt	--	--	--	
439	5/4-26B1			615	620	187.5	189.0	basalt, fine-grained gray	Basalt	--	--	--	
439	5/4-26B1			620	625	189.0	190.5	basalt, gray, vesicular; some pumice	Basalt	--	--	--	
439	5/4-26B1			625	728	190.5	221.9	tuff, consists of fragments of red and gray basalt, pumice, obsidian, and pyrite	Ash or tuff	--	--	--	
439	5/4-26B1			728	735	221.9	224.0	basalt, red, sample contains cave of tuff, vesicular	Basalt	--	--	--	
439	5/4-26B1			735	740	224.0	225.6	vesicular basalt, reddish-brown	Basalt	--	--	--	
439	5/4-26B1			740	750	225.6	228.6	vesicular basalt, mixed brown and gray	Basalt	--	--	--	
439	5/4-26B1			750	755	228.6	230.1	basalt, gray, fine-grained, sample contains large percentage of cave	Basalt	--	--	--	
439	5/4-26B1			755	760	230.1	231.6	basalt, gray, fine-grained, slightly glassy texture, slightly porphyritic some cave of red vesicular basalt in sample	Basalt	--	--	--	

**Appendix 3.** Lithologic data.—Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
439	5/4-26B1			760	765	231.6	233.2	basalt, gray, fine-grained samples contains considerable cave basalt, gray, fine-grained slightly glassy sample contains much cave	Basalt	--	--	--	
439	5/4-26B1			765	770	233.2	234.7	basalt, gray, fine-grained	Basalt	--	--	--	
439	5/4-26B1			770	799	234.7	243.5	agglomerate mixture of red and black vesicular basalt and a little	Basalt	--	--	--	
439	5/4-26B1			799	805	243.5	245.4	pumice	Basalt	--	--	--	
439	5/4-26B1			805	821	245.4	250.2	agglomerate	Clay, sand, and gravel	--	--	--	
439	5/4-26B1			821	830	250.2	253.0	basalt, gray, fine-grained	Basalt	--	--	--	
439	5/4-26B1			830	835	253.0	254.5	basalt, dark gray, slightly vesicular and amygdaloidal	Basalt	--	--	--	
439	5/4-26B1			835	850	254.5	259.1	basalt, vesicular and amygdaloidal, some oxidized	Basalt	--	--	--	
439	5/4-26B1			850	855	259.1	260.6	basalt in sample	Basalt	--	--	--	
439	5/4-26B1			855	860	260.6	262.1	basalt, slightly oxidized	Basalt	--	--	--	
439	5/4-26B1			860	905	262.1	275.8	agglomerate, basaltic, red and gray, vesicular	Basalt	--	--	--	
439	5/4-26B1			905	910	275.8	277.4	agglomerate, slightly tuffaceous	Clay, sand, and gravel	--	--	--	
439	5/4-26B1			910	953	277.4	290.5	agglomerate	Ash or tuff	--	--	--	
439	5/4-26B1			953	965	290.5	294.1	agglomerate, soft grayish brown	Clay, sand, and gravel	--	--	--	
439	5/4-26B1			965	980	294.1	298.7	agglomerate, basaltic, chiefly black, some red vesicular and amygdaloidal	Basalt	--	--	--	
439	5/4-26B1			980	1015	298.7	309.4	agglomerate, basaltic, chiefly red vesicular basalt	Basalt	--	--	--	
439	5/4-26B1			1015	1025	309.4	312.4	agglomerate, basaltic, chiefly brownish-gray vesicular and amygdaloidal basalt	Basalt	--	--	--	
439	5/4-26B1			1025	1065	312.4	324.6	agglomerate, basaltic, chiefly brownish-red vesicular basalt	Basalt	--	--	--	
439	5/4-26B1			1065	1090	324.6	332.2	basaltic, gray porphyritic, slightly vesicular	Basalt	--	--	--	
439	5/4-26B1			1090	1140	332.2	347.5	tuffaceous agglomerate, chiefly basalt, some pumice	Ash or tuff	--	--	--	
439	5/4-26B1			1140	1182	347.5	360.3	agglomerate, basaltic, mixed oxidized and unoxidized basalt, some pumice	Basalt	--	--	--	
439	5/4-26B1			1182	1187	360.3	361.8	agglomerate, basaltic red	Basalt	--	--	--	
439	5/4-26B1			1187	1236	361.8	376.7	vesicular	Basalt	--	--	--	
439	5/4-26B1			1236	1335	376.7	406.9	agglomerate, basaltic, mixed oxidized and unoxidized basalt, some pumice	Ash or tuff	--	--	--	
439	5/4-26B1			1335	1390	406.9	423.7	tuff, top of tuff oxidized	Ash or tuff	--	--	--	
439	5/4-26B1			1390	1440	423.7	438.9	tuff, top of tuff oxidized	Ash or tuff	--	--	--	
440	5/4-26E1	440	5/4-26E1	0	4	406.9	438.9	soil	Sand and clay	--	--	--	Qoal
440	5/4-26E1			4	10	1.2	3.0	gravel, red	Gravel	--	--	--	
440	5/4-26E1			10	18	3.0	5.5	gravel, hard mixed	Gravel	hard	--	--	
440	5/4-26E1							sandy yellow clay and gravel.					
440	5/4-26E1			18	62	5.5	18.9	Fresh water (5 pts.) at 49'	Clay, sand, and gravel	--	--	--	
440	5/4-26E1			62	125	18.9	38.1	clay, blue, and gravel	Clay and gravel	--	--	--	
440	5/4-26E1			125	260	38.1	79.2	agglomerate, volcanic with blue-black clay. piece of redwood at 250 ft.	Ash or tuff	--	--	wood	Tsv
440	5/4-26E1			260	315	79.2	96.0	tuff, contains pumice, sticky like clay	Ash or tuff	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
440	5/4-26E1			315	375	96.0	114.3	agglomerate, red to black, basaltic, red at 365 ft., vesicular to nonvesicular, no pumice	Basalt	--	--	--	
440	5/4-26E1			375	437	114.3	133.2	basalt, black, hard	Basalt	hard	--	--	
440	5/4-26E1			437	454	133.2	138.4	agglomerate, red, basaltic, vesicular; some black	Basalt	--	--	--	
440	5/4-26E1			454	465	138.4	141.7	basalt, gray, fine-grained, shows some oxidation	Basalt	--	--	--	
440	5/4-26E1			465	475	141.7	144.8	agglomerate, red to brown, vesicular	Ash or tuff	--	--	--	
440	5/4-26E1			475	480	144.8	146.3	basalt, gray, fine-grained, vesicular to nonvesicular	Basalt	--	--	--	
440	5/4-26E1			480	495	146.3	150.9	agglomerate, gray, basaltic; pumice present	Basalt	--	--	--	
440	5/4-26E1			495	502	150.9	153.0	tuff, coarse-grained, pumice, some pyrite	Ash or tuff	--	--	--	
440	5/4-26E1			502	560	153.0	170.7	agglomerate, grayish green, vesicular; some pumice and obsidian	Ash or tuff	--	--	--	
440	5/4-26E1			560	570	170.7	173.7	red vesicular agglomerate, some unoxidized basalt	Basalt	--	--	--	
440	5/4-26E1			570	620	173.7	189.0	basalt, light gray, some red vesicular basalt near bottom of strata	Basalt	--	--	--	
440	5/4-26E1			620	630	189.0	192.0	agglomerate, basaltic, consists of red and gray vesicular and nonvesicular basalt	Basalt	--	--	--	
440	5/4-26E1			630	638	192.0	194.5	tuff, agglomerate, contains pumice, obsidian, red and gray vesicular basalt, and nonvesicular gray basalt	Ash or tuff	--	--	--	
440	5/4-26E1			638	698	194.5	212.8	basalt, gray, fine-grained, finely porphyritic, finely vesicular near bottom, slightly oxidized at bottom of strata, jointed throughout	Basalt	--	--	--	
440	5/4-26E1			698	713	212.8	217.3	Tuff, agglomerate, vesicular and nonvesicular gray basalt, and red vesicular basalt	Ash or tuff	--	--	--	
440	5/4-26E1			713	742	217.3	226.2	agglomerate, basaltic, consists chiefly of dark gray, very vesicular basalt, some oxidized basalt	Basalt	--	--	--	
440	5/4-26E1							basalt, light gray, slightly vesicular, very hard and jointed. strata still persists at 806 ft. although much softer and more vesicular than higher strata					
440	5/4-26E1			742	806	226.2	245.7	soil	Basalt	hard	--	--	
441	5/4-27H2	441	5/4-27H2	0	3	0.0	0.9	clay, yellow; and gravel	Sand and clay	--	--	--	Qyal
441	5/4-27H2			3	65	0.9	19.8	clay, blue and gravel	Clay and gravel	--	--	--	
441	5/4-27H2			65	225	19.8	68.6	Clay and gravel	--	--	--	Qoal (?)	
441	5/4-27H2			225	303	68.6	92.4	mud, black	Clay and sand (or sandstone)	--	--	--	
441	5/4-27H2			303	320	92.4	97.5	clay, blue	Clay	--	--	--	
441	5/4-27H2			320	354	97.5	107.9	clay, blue and black mud	Clay and sand (or sandstone)	--	--	--	
441	5/4-27H2							clay, gravel blue; blue rock and boulders	Clay and gravel	--	--	--	Tsv
441	5/4-27H2			354	460	107.9	140.2	Basalt	hard	--	--	--	
441	5/4-27H2			460	470	140.2	143.3	lava, hard	Basalt	hard	--	--	
441	5/4-27H2			470	492	143.3	150.0	lava, very hard	Basalt	hard	--	--	
441	5/4-27H2			492	495	150.0	150.9	lava, soft	Basalt	--	--	--	
441	5/4-27H2			495	509	150.9	155.1	clay, blue	Clay	--	--	--	
441	5/4-27H2			509	518	155.1	157.9	clay and lava rock	Clay and gravel	--	--	--	

**Appendix 3.** Lithologic data.—Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--) not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
441	5/4-27H2			518	527	157.9	160.6	lava, hard	Basalt	hard	--	--	--
441	5/4-27H2			527	555	160.6	169.2	rock and brown clay	Clay and gravel	--	--	--	--
441	5/4-27H2			555	562	169.2	171.3	clay and hard rock	Clay and gravel	--	--	--	--
441	5/4-27H2			562	570	171.3	173.7	lava rock	Basalt	hard	--	--	--
441	5/4-27H2			570	580	173.7	176.8	lava, hard	Basalt	hard	--	--	--
441	5/4-27H2			580	608	176.8	185.3	lava, black	Basalt	--	--	--	--
441	5/4-27H2			608	624	185.3	190.2	lava, hard; boulder	Basalt	hard	--	--	--
441	5/4-27H2			624	630	190.2	192.0	lava, hard	Basalt	hard	--	--	--
441	5/4-27H2			630	657	192.0	200.3	clay, blue	Clay	--	--	--	--
441	5/4-27H2			657	664	200.3	202.4	lava, hard	Basalt	hard	--	--	--
441	5/4-27H2			664	668	202.4	203.6	rock, soft	Ash or tuff	hard	--	--	--
441	5/4-27H2			668	673	203.6	205.1	cinders, red	Basalt	--	--	--	--
441	5/4-27H2			673	705	205.1	214.9	lava, hard	Basalt	hard	--	--	--
441	5/4-27H2			705	720	214.9	219.5	lava, hard	Basalt	hard	--	--	--
441	5/4-27H2			720	725	219.5	221.0	cinders	Basalt	--	--	--	--
441	5/4-27H2			725	740	221.0	225.6	hard lava	Basalt	hard	--	--	--
441	5/4-27H2			740	745	225.6	227.1	gray sandstone	Sandstone	cemented	--	--	--
441	5/4-27H2			745	750	227.1	228.6	lava, soft	Basalt	--	--	--	--
441	5/4-27H2			750	758	228.6	231.0	hard lava	Basalt	hard	--	--	--
441	5/4-27H2			758	802	231.0	244.4	clay, green, sticky and sand	Clay and sand (or sandstone)	--	--	--	--
441	5/4-27H2			802	807	244.4	246.0	boulders and clay	Clay and gravel	--	--	--	--
441	5/4-27H2			807	815	246.0	248.4	clay and sand	Clay and sand (or sandstone)	--	--	--	--
441	5/4-27H2			815	822	248.4	250.5	lava rock	Basalt	hard	--	--	--
441	5/4-27H2			822	830	250.5	253.0	clay and lava sand	Clay and gravel	--	--	--	--
441	5/4-27H2			830	860	253.0	262.1	lava, black	Basalt	--	--	--	--
442	5/5-26G1	442	5/5-26G1	0	3	0.0	0.9	surface	Sand and clay	--	--	--	Tsv
442	5/5-26G1		5/5-26G1	3	45	0.9	13.7	rock, gray tuff	Ash or tuff	hard	--	--	
442	5/5-26G1		5/5-26G1	45	240	13.7	73.2	rock, blue tuff, water	Sandstone	hard	--	--	
442	5/5-26G1		5/5-26G1	240	260	73.2	79.2	basalt boulders, water	Basalt	--	--	--	
442	5/5-26G1		5/5-26G1	260	290	79.2	88.4	rock, blue tuff	Sandstone	hard	--	--	
442	5/5-26G1		5/5-26G1	290	300	88.4	91.4	lava rock, red	Basalt	hard	--	--	
442	5/5-26G1		5/5-26G1	300	355	91.4	108.2	volcanic ash, white	Ash or tuff	--	--	--	
442	5/5-26G1		5/5-26G1	355	410	108.2	125.0	rock, blue tuff	Ash or tuff	hard	--	--	
443	5/4-27H1	443	5/4-27H1	0	7	0.0	2.1	soil	Sand and clay	--	--	--	Qyal and Qoal
443	5/4-27H1		5/4-27H1	7	20	2.1	6.1	clay, blue	Clay	--	--	--	
443	5/4-27H1		5/4-27H1	20	55	6.1	16.8	clay, yellow; and gravel	Clay and gravel	--	--	--	
443	5/4-27H1		5/4-27H1	55	64	16.8	19.5	clay, yellow	Clay	--	--	--	
443	5/4-27H1		5/4-27H1	64	75	19.5	22.9	clay and gravel	Clay and gravel	--	--	--	
443	5/4-27H1		5/4-27H1	75	84	22.9	25.6	muck, blue	Clay and sand (or sandstone)	--	--	--	
443	5/4-27H1		5/4-27H1	84	120	25.6	36.6	mud and gravel	Clay, sand, and gravel	--	--	--	
443	5/4-27H1		5/4-27H1	120	130	36.6	39.6	clay, blue and gravel	Clay and gravel	--	--	--	
443	5/4-27H1		5/4-27H1	130	193	39.6	58.8	clay, blue	Clay	--	--	--	
443	5/4-27H1		5/4-27H1	193	245	58.8	74.7	clay, blue and gravel	Clay and gravel	--	--	--	
443	5/4-27H1			245	325	74.7	99.1	clay, blue, black mud, and gravel	Clay and sand (or sandstone)	--	--	--	
443	5/4-27H1			325	358	99.1	109.1	lava, gravel, water worn	Basalt	--	--	--	
443	5/4-27H1			358	362	109.1	110.3	cinders, red	Basalt	--	--	--	Tsv
443	5/4-27H1			362	387	110.3	118.0	clay, blue, and gravel	Clay and gravel	--	--	--	
443	5/4-27H1			387	395	118.0	120.4	mud and gravel, black	Clay, sand, and gravel	--	--	--	
443	5/4-27H1			395	412	120.4	125.6	clay, blue, and boulders; smooth	Clay and gravel	--	--	--	
443	5/4-27H1			412	472	125.6	143.9	cinders, red and black	Basalt	--	--	--	
443	5/4-27H1			472	505	143.9	153.9	lava, blue-black	Basalt	--	--	--	
443	5/4-27H1			505	509	153.9	155.1	lava ash, red	Basalt	--	--	--	
443	5/4-27H1			509	523	155.1	159.4	lava, blue, hard	Basalt	hard	--	--	
443	5/4-27H1			523	539	159.4	164.3	lava, black	Basalt	--	--	--	
443	5/4-27H1			539	575	164.3	175.3	lava rock	Basalt	hard	--	--	
443	5/4-27H1			575	672	175.3	204.8	lava, blue, soft	Basalt	--	--	--	
443	5/4-27H1			672	677	204.8	206.3	hard lava	Basalt	hard	--	--	
443	5/4-27H1			677	695	206.3	211.8	soft lava	Basalt	--	--	--	
443	5/4-27H1			695	720	211.8	219.5	hard lava	Basalt	hard	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
443	5/4-27H1			720	820	219.5	249.9	lava, blue, soft and sticky	Basalt	--	--	--	
443	5/4-27H1			820	830	249.9	253.0	loose lava, light blue	Basalt	--	--	--	
443	5/4-27H1			830	842	253.0	256.6	hard dark lava	Basalt	hard	--	--	
443	5/4-27H1			842	960	256.6	292.6	volcanic ash and lava particles, sticky like clay	Ash or tuff	--	--	--	
443	5/4-27H1			960	980	292.6	298.7	hard black lava	Basalt	hard	--	--	
443	5/4-27H1			980	990	298.7	301.8	lava rock and red cinders	Basalt	hard	--	--	
443	5/4-27H1			990	1005	301.8	306.3	lava, gray	Basalt	--	--	--	
443	5/4-27H1			1005	1015	306.3	309.4	tuff, gray	Ash or tuff	--	--	--	
443	5/4-27H1			1015	1070	309.4	326.1	lava, blue-gray	Basalt	--	--	--	
443	5/4-27H1			1070	1085	326.1	330.7	tuff and pumice, gray	Ash or tuff	--	--	--	
443	5/4-27H1			1085	1110	330.7	338.3	tuff, gray; hard lava	Ash or tuff	hard	--	--	
443	5/4-27H1			1110	1226	338.3	373.7	tuff, gray or sandy clay	Ash or tuff	--	--	--	
444	5/4-29F1	444	5/4-29F1	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qh
444	5/4-29F1			3	38	0.9	11.6	clay, yellow	Clay	--	--	--	
444	5/4-29F1			38	57	11.6	17.4	clay, blue	Clay	--	--	--	
444	5/4-29F1			57	58	17.4	17.7	water	Clay	--	--	--	
444	5/4-29F1			58	84	17.7	25.6	clay, blue	Clay	--	--	--	
444	5/4-29F1			84	90	25.6	27.4	sandstone	Sandstone	cemented	--	--	Knoxville and Horsetown Formations
444	5/4-29F1			90	106	27.4	32.3	shale	Clay and sand (or sandstone)	cemented	--	--	
445	5/4-27K2	445	5/4-27K2	0	3	0.0	0.9	soil	Sand and clay	--	--	--	Qyal and Qoal
445	5/4-27K2			3	10	0.9	3.0	tule mud	Clay and sand (or sandstone)	--	--	tule	
445	5/4-27K2			10	42	3.0	12.8	clay or mud, blue	Clay and sand (or sandstone)	--	--	--	
445	5/4-27K2			42	51	12.8	15.5	clay, sandy, yellow; gravel with	Clay, sand, and gravel	--	--	--	
445	5/4-27K2			51	60	15.5	18.3	stiff clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
445	5/4-27K2			60	77	18.3	23.5	gravel blue with clay	Clay and gravel	--	--	--	
445	5/4-27K2			77	83	23.5	25.3	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
445	5/4-27K2			83	92	25.3	28.0	sand, blue with clay	Sand and clay	--	--	--	
445	5/4-27K2			92	105	28.0	32.0	tule mud	Clay and sand (or sandstone)	--	--	tule	
445	5/4-27K2			105	114	32.0	34.7	stiff clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
445	5/4-27K2			114	118	34.7	36.0	sand, blue with clay	Sand and clay	--	--	--	
445	5/4-27K2			118	125	36.0	38.1	stiff clay, blue	Clay	--	--	--	
445	5/4-27K2			125	135	38.1	41.1	sand, blue, and gravel with clay	Clay, sand, and gravel	--	--	--	
445	5/4-27K2			135	148	41.1	45.1	stiff, clay, blue	Clay	--	--	--	
445	5/4-27K2			148	170	45.1	51.8	clay, sandy, blue with gravel streaks	Clay and gravel	--	--	--	
445	5/4-27K2			170	230	51.8	70.1	stiff clay, blue with gravel streaks	Clay and gravel	--	--	--	
445	5/4-27K2			230	259	70.1	78.9	volcanic tuff, slight increase in water	Ash or tuff	--	--	--	Tsv (?)
445	5/4-27K2			259	280	78.9	85.3	mud or clay, brownish with fine sand and gravel	Clay and sand (or sandstone)	--	--	--	
445	5/4-27K2			280	292	85.3	89.0	fine sand and gravel with clay struck a redwood log. fine sand and clay	Clay, sand, and gravel	--	--	--	
445	5/4-27K2			292	310	89.0	94.5	gravel, blue water-worn with green lava rock. Increase in flow of water	Sand and clay	--	--	wood	
445	5/4-27K2			310	329	94.5	100.3	Clay, sand, and gravel	Clay, sand, and gravel	--	--	--	
445	5/4-27K2			329	343	100.3	104.5	gravel with more clay	Clay and gravel	--	--	--	
445	5/4-27K2			343	355	104.5	108.2	mud or ash, brown	Clay and sand (or sandstone)	--	--	--	
445	5/4-27K2			355	358	108.2	109.1	gravel, blue, water-worn	Gravel	--	--	--	
445	5/4-27K2			358	382	109.1	116.4	ash brown, with gravel	Ash or tuff	--	--	--	
445	5/4-27K2			382	393	116.4	119.8	gravel, blue, water-worn	Gravel	--	--	--	
445	5/4-27K2			393	400	119.8	121.9	fine gray sand and clay	Sand and clay	--	--	--	
445	5/4-27K2			400	407	121.9	124.1	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
445	5/4-27K2			407	450	124.1	137.2	conglomerate of burnt rock, cinders	Clay, sand, and gravel	--	--	--	
445	5/4-27K2			450	456	137.2	139.0	rock, dark, close-grained	Clay, sand, and gravel	hard	--	--	
446	5/4-26M1	446	5/4-26M1	0	4	0.0	1.2	soil	Sand and clay	--	--	--	Qyal and Qoal
446	5/4-26M1			4	44	1.2	13.4	clay, yellow, and gravel	Clay and gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
446	5/4-26M1			44	95	13.4	29.0	clay, blue, and gravel	Clay and gravel	--	--	--	
446	5/4-26M1			95	135	29.0	41.1	lava, black, soft vesicular	Basalt	--	--	--	
446	5/4-26M1			135	280	41.1	85.3	tuff, dark color, very little pumice	Ash or tuff	--	--	--	
446	5/4-26M1			280	340	85.3	103.6	basalt, gray	Basalt	--	--	--	
446	5/4-26M1			340	370	103.6	112.8	basalt, mixed gray, vesicular and red oxidized basalt	Basalt	--	--	--	
446	5/4-26M1			370	405	112.8	123.4	basalt, gray	Basalt	--	--	--	
446	5/4-26M1			405	410	123.4	125.0	mixed tuff and basalt	Ash or tuff	--	--	--	
446	5/4-26M1			410	416	125.0	126.8	basalt, grayish-black	Basalt	--	--	--	
446	5/4-26M1			416	430	126.8	131.1	tuff	Ash or tuff	--	--	--	
446	5/4-26M1			430	435	131.1	132.6	basalt, gray	Basalt	--	--	--	
446	5/4-26M1			435	440	132.6	134.1	basalt, reddish-brown vesicular oxidized	Basalt	--	--	--	
446	5/4-26M1			440	536	134.1	163.4	basalt, gray, glassy to vesicular	Basalt	--	--	--	
446	5/4-26M1			536	592	163.4	180.4	tuff, sticky like clay, contains pumice	Ash or tuff	--	--	--	
446	5/4-26M1			592	630	180.4	192.0	basalt, gray, glassy to vesicular	Basalt	--	--	--	
446	5/4-26M1			630	655	192.0	199.6	basalt, red oxidized, glassy to vesicular	Basalt	--	--	--	
446	5/4-26M1			655	675	199.6	205.7	basalt, blue-black	Basalt	--	--	--	
446	5/4-26M1			675	692	205.7	210.9	basalt, blue-black, vesicular	Basalt	--	--	--	
446	5/4-26M1			692	835	210.9	254.5	tuff, sticky, contains pumice	Ash or tuff	--	--	--	
446	5/4-26M1			835	840	254.5	256.0	mixed tuff and glassy basalt	Ash or tuff	--	--	--	
446	5/4-26M1			840	875	256.0	266.7	tuff	Ash or tuff	--	--	--	
446	5/4-26M1			875	890	266.7	271.3	mixed tuff and basalt	Ash or tuff	--	--	--	
446	5/4-26M1			890	900	271.3	274.3	basalt, light-gray, porphyritic	Basalt	--	--	--	
446	5/4-26M1			900	939	274.3	286.2	mixed tuff and basalt, very hard	Ash or tuff	hard	--	--	
447	5/4-27K1	447	5/4-27K1	0	6	0.0	1.8	adobe, black	Sand and clay	--	--	--	Qyal and Qoal
447	5/4-27K1			6	13	1.8	4.0	fine gravel in clay	Clay and gravel	--	--	--	
447	5/4-27K1			13	24	4.0	7.3	stiff clay, yellow	Clay	--	--	--	
447	5/4-27K1			24	40	7.3	12.2	gravel with yellow clay	Clay and gravel	--	--	--	
447	5/4-27K1			40	43	12.2	13.1	stiff clay, yellow	Clay	--	--	--	
447	5/4-27K1			43	68	13.1	20.7	stiff clay, blue	Clay	--	--	--	
447	5/4-27K1			68	75	20.7	22.9	sand, blue with clay	Sand and clay	--	--	--	
447	5/4-27K1			75	105	22.9	32.0	gravel, blue, water-worn. Water rose to 12 ft below surface	Gravel	--	--	--	
447	5/4-27K1			105	110	32.0	33.5	gravel in clay	Clay and gravel	--	--	--	
447	5/4-27K1			110	117	33.5	35.7	boulder, hard lava (?)	Gravel	hard	--	--	Tsv
447	5/4-27K1			117	135	35.7	41.1	lava rock, porous	Basalt	hard	--	--	
447	5/4-27K1			135	190	41.1	57.9	lava rock, greenish color clinker and gravel. Increase in water	Basalt	hard	--	--	
447	5/4-27K1			190	204	57.9	62.2	cinders, reddish-brown, slight flow of water	Basalt	--	--	--	
447	5/4-27K1			204	235	62.2	71.6	ash or mud, dark brown	Basalt	--	--	--	
447	5/4-27K1			235	243	71.6	74.1	lava rock, green	Ash or tuff	--	--	--	
447	5/4-27K1			243	267	74.1	81.4	cinders. Increase in flow of water rock, very hard close-grained dark-	Basalt	hard	--	--	
447	5/4-27K1			267	273	81.4	83.2	colored	Basalt	--	--	--	
448	5/4-26M2	448	5/4-26M2	273	276	83.2	84.1	Ash or tuff	hard	--	--	--	Qyal
448	5/4-26M2		5/4-26M2	0	3	0.0	0.9	soil	Sand and clay	--	--	--	
448	5/4-26M2			3	30	0.9	9.1	sandy clay, yellow	Clay and sand (or sandstone)	--	--	--	
448	5/4-26M2			30	50	9.1	15.2	clay, blue, hard	Clay	hard	--	--	
448	5/4-26M2			50	93	15.2	28.3	sandy clay, blue	Clay and sand (or sandstone)	--	--	--	
448	5/4-26M2			93	150	28.3	45.7	agglomerate, red, vesicular	Ash or tuff	--	--	--	
448	5/4-26M2			150	325	45.7	99.1	basalt, blue-gray	Basalt	--	--	--	
448	5/4-26M2			325	340	99.1	103.6	agglomerate, mixed red and basalt	Basalt	--	--	--	
448	5/4-26M2			340	375	103.6	114.3	basalt, gray	Basalt	--	--	--	
448	5/4-26M2			375	408	114.3	124.4	basalt, blue-gray	Basalt	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
448	5/4-26M2			408	432	124.4	131.7	agglomerate, red, vesicular	Ash or tuff	--	--	--	
448	5/4-26M2				432	442	131.7	134.7	basalt	Basalt	--	--	--
448	5/4-26M2				442	483	134.7	147.2	agglomerate, red, vesicular	Ash or tuff	--	--	--
448	5/4-26M2												
448	5/4-26M2			483	590	147.2	179.8	basalt, brownish-black, vesicular	Basalt	--	--	--	
448	5/4-26M2				590	605	179.8	184.4	basalt, light-gray	Basalt	--	--	--
448	5/4-26M2				605	620	184.4	189.0	basalt, dark-gray	Basalt	--	--	--
448	5/4-26M2												
448	5/4-26M2			620	682	189.0	207.9	basalt, mixed gray, vesicular and red vesicular agglomerate	Basalt	--	--	--	
449	5/4-29K1	449	5/4-29K1	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Qh
449	5/4-29K1			2	25	0.6	7.6	clay, yellow	Clay	--	--	--	
449	5/4-29K1			25	26	7.6	7.9	boulders and clay	Clay and gravel	--	--	--	
449	5/4-29K1			26	33	7.9	10.1	clay, yellow	Clay	--	--	--	
449	5/4-29K1			33	42	10.1	12.8	boulders and clay	Clay and gravel	--	--	--	
449	5/4-29K1			42	105	12.8	32.0	clay, yellow	Clay	--	--	--	
450	5/4-26N1	450	5/4-26N1	0	2	0.0	0.6	soil	Sand and clay	--	--	--	Qoal
450	5/4-26N1			2	6	0.6	1.8	hardpan	Clay and gravel	hard	--	--	
450	5/4-26N1			6	12	1.8	3.7	clay, sandy	Clay and sand (or sandstone)	--	--	--	
450	5/4-26N1			12	45	3.7	13.7	clay and gravel	Clay and gravel	--	--	--	
450	5/4-26N1			45	50	13.7	15.2	clay, yellow	Clay	--	--	--	
450	5/4-26N1			50	385	15.2	117.3	agglomerate, red, vesicular basalt, blue, platy to blocky, some blue clay	Ash or tuff	--	--	--	Tsv
450	5/4-26N1				385	450	117.3	137.2	Basalt	--	--	--	
451	5/4-29N2	451	5/4-29N2	0	310	0.0	94.5	clay, brown (Not enough water for domestic use)	Clay	--	--	--	Qh
451	5/4-29N2			105	310	32.0	94.5	no data	No data	--	--	--	
452	5/4-30R1			0	900	0.0	274.3	clay, yellow	Clay	--	--	--	Qal and Qh
452	5/4-30R1												
453	5/4-29N1	453	5/4-29N1	900	1400	274.3	426.7	shale, gray or Neroly sandstone, flow of brackish water	Clay and sand (or sandstone)	cemented	--	--	Neroly sandstone
453	5/4-29N1			0	33	0.0	10.1	no data	No data	--	--	--	
454	5/4-29Q1	454	5/4-29Q1	0	170	0.0	51.8	clay, yellow	Clay	--	--	--	Qh
455	5/4-29Q2			0	8	0.0	2.4	soil	Sand and clay	--	--	--	
455	5/4-29Q2			8	45	2.4	13.7	clay, yellow	Clay	--	--	--	
455	5/4-29Q2			45	70	13.7	21.3	sand, yellow and water	Sand	--	--	--	
455	5/4-29Q2			70	139	21.3	42.4	clay, blue	Clay	--	--	--	
455	5/4-29Q2			139	143	42.4	43.6	gravel and water	Gravel	--	--	--	
455	5/4-29Q2			143	149	43.6	45.4	clay, yellow and boulders	Clay and gravel	--	--	--	
456	5/4-27R1	456	5/4-27R1	0	42	0.0	12.8	mud blue	Clay and sand (or sandstone)	--	--	--	Qyal
456	5/4-27R1			42	82	12.8	25.0	gravel	Gravel	--	--	--	
456	5/4-27R1			82	107	25.0	32.6	clay, blue and gravel	Clay and gravel	--	--	--	
456	5/4-27R1			107	125	32.6	38.1	clay green impervious	Clay	--	--	--	
456	5/4-27R1			125	128	38.1	39.0	gravel	Gravel	--	--	--	
456	5/4-27R1			128	168	39.0	51.2	clay, blue and gravel	Clay and gravel	--	--	--	
456	5/4-27R1			168	171	51.2	52.1	dark-lava gravel	Gravel	--	--	--	
456	5/4-27R1			171	175	52.1	53.3	lava, blue-gray	Basalt	--	--	--	
456	5/4-27R1			175	178	53.3	54.3	tuff, maroon, with lava	Ash or tuff	--	--	--	
456	5/4-27R1			178	180	54.3	54.9	lava with maroon tuff	Basalt	--	--	--	
456	5/4-27R1			180	267	54.9	81.4	tuff, maroon	Ash or tuff	--	--	--	
456	5/4-27R1			267	270	81.4	82.3	tuff with lava	Ash or tuff	--	--	--	
456	5/4-27R1			270	275	82.3	83.8	tuff maroon	Ash or tuff	--	--	--	
456	5/4-27R1			275	317	83.8	96.6	lava, dark, porous	Basalt	--	--	--	
456	5/4-27R1			317	322	96.6	98.1	lava, dark, with tuff	Basalt	--	--	--	
456	5/4-27R1							lava, dark; some blue clay with					
456	5/4-27R1			322	357	98.1	108.8	sand	Basalt	--	--	--	
456	5/4-27R1			357	368	108.8	112.2	sand, dark colored with clay	Sand and clay	--	--	--	
456	5/4-27R1			368	485	112.2	147.8	lava, dark, fine-grained	Basalt	--	--	--	
457	5/4-30P1	457	5/4-30P1	0	15	0.0	4.6	surface	Sand and clay	--	--	--	Qh
457	5/4-30P1			15	200	4.6	61.0	clay, yellow	Clay	--	--	--	
457	5/4-30P1			200	253	61.0	77.1	clay, blue	Clay	--	--	--	
457	5/4-30P1			253	257	77.1	78.3	clay and gravel; some water	Clay and gravel	--	--	--	

**Appendix 3.** Lithologic data. —Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (—), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
457	5/4-30P1			257	347	78.3	105.8	clay, blue	Clay	--	--	--	
458	5/4-27Q1	458	5/4-27Q1	0	6	0.0	1.8	soil	Sand and clay	--	--	--	Qyal
458	5/4-27Q1			6	34	1.8	10.4	hard gravel, salt water	Gravel	hard	--	--	
458	5/4-27Q1			34	115	10.4	35.1	loose gravel, salty water	Gravel	--	--	--	Qoal
458	5/4-27Q1			115	120	35.1	36.6	clay, blue	Clay	--	--	--	
458	5/4-27Q1			120	252	36.6	76.8	sand, blue, and clay	Sand and clay	--	--	--	
458	5/4-27Q1			252	287	76.8	87.5	shale, brown	Undifferentiated basement	cemented	--	--	Knoxville and Horsetown Formations
458	5/4-27Q1			287	315	87.5	96.0	shale, brown; and blue sand	Undifferentiated basement	cemented	--	--	
								shale, brown, blue clay, yellow					
458	5/4-27Q1			315	382	96.0	116.4	clay, blue shale	Undifferentiated basement	cemented	--	--	
458	5/4-27Q1			382	490	116.4	149.4	clay, yellow; and gravel	Undifferentiated basement	--	--	--	
								clay, blue and yellow; volcanic					
458	5/4-27Q1			490	555	149.4	169.2	rock gravel	Undifferentiated basement	--	--	--	
458	5/4-27Q1			555	570	169.2	173.7	sand, blue, close	Undifferentiated basement	--	--	--	
458	5/4-27Q1			570	575	173.7	175.3	sand, blue, compact	Undifferentiated basement	cemented	--	--	
458	5/4-27Q1			575	712	175.3	217.0	not described	No data	--	--	--	
459	5/4-27R2	459	5/4-27R2	0	4	0.0	1.2	tule mud	Clay and sand (or sandstone)	--	--	--	Qyal
459	5/4-27R2			4	25	1.2	7.6	clay, blue	Clay	--	--	--	
459	5/4-27R2			25	45	7.6	13.7	clay, sandy, blue	Clay and sand (or sandstone)	--	--	--	
459	5/4-27R2			45	73	13.7	22.3	loose gravel	Gravel	--	--	--	
459	5/4-27R2			73	94	22.3	28.7	boulders and gravel	Gravel	--	--	--	
459	5/4-27R2			94	105	28.7	32.0	light gravel	Gravel	--	--	--	
459	5/4-27R2			105	107	32.0	32.6	clay and gravel	Clay and gravel	--	--	--	
459	5/4-27R2			107	150	32.6	45.7	volcanic clay, green	Ash or tuff	--	--	--	Qoal
459	5/4-27R2			150	160	45.7	48.8	rock, green	Ash or tuff	hard	--	--	
459	5/4-27R2			160	250	48.8	76.2	lava, red; rock	Basalt	hard	--	--	Tsv
459	5/4-27R2			250	266	76.2	81.1	rock, red, harder	Basalt	hard	--	--	
459	5/4-27R2			266	269	81.1	82.0	rock, blue hard	Basalt	hard	--	--	
459	5/4-27R2			269	272	82.0	82.9	rock, red, hard	Basalt	hard	--	--	
459	5/4-27R2			272	302	82.9	92.0	rock, red, softer	Basalt	hard	--	--	
459	5/4-27R2			302	330	92.0	100.6	rock, very hard	Basalt	hard	--	--	
460	5/4-35R4	460	5/4-35R4	0	5	0.0	1.5	topsoil	Sand and clay	--	--	--	Qyal and Qoal (?)
460	5/4-35R4			5	30	1.5	9.1	gravel in clay	Clay and gravel	--	--	--	
460	5/4-35R4			30	68	9.1	20.7	clay yellow	Clay	--	--	--	
								San Pablo group undifferentiated,					
460	5/4-35R4			68	217	20.7	66.1	shale, gray	Undifferentiated basement	cemented	--	--	San Pablo Group
460	5/4-35R4			217	429	66.1	130.8	shale, black	Undifferentiated basement	cemented	--	--	
460	5/4-35R4			429	439	130.8	133.8	gum, black, asphalt like	Undifferentiated basement	--	--	black gum	
460	5/4-35R4			439	453	133.8	138.1	rock	Undifferentiated basement	hard	--	--	
460	5/4-35R4			453	1082	138.1	329.8	shale, gray	Undifferentiated basement	cemented	--	--	
460	5/4-35R4			1082	1090	329.8	332.2	rock	Undifferentiated basement	hard	--	--	
460	5/4-35R4			1090	1105	332.2	336.8	shale, hard	Undifferentiated basement	hard	--	--	
460	5/4-35R4			1105	1115	336.8	339.9	boulders	Undifferentiated basement	--	--	--	
460	5/4-35R4			1115	1202	339.9	366.4	shale, black	Undifferentiated basement	cemented	--	--	
460	5/4-35R4			1202	1205	366.4	367.3	sand, black	Undifferentiated basement	--	--	--	
460	5/4-35R4			1205	1208	367.3	368.2	shale, light	Undifferentiated basement	cemented	--	--	
461	4/4-4C1	461	4/4-4C1	0	10	0.0	3.0	surface	Sand and clay	--	--	--	Qyal
461	4/4-4C1			10	25	3.0	7.6	clay, yellow	Clay	--	--	--	Qh (?)
								clay, yellow; sand and some					
461	4/4-4C1			25	60	7.6	18.3	gravel	Clay, sand, and gravel	--	--	--	
461	4/4-4C1			60	80	18.3	24.4	gravel and sand; some yellow clay	Sand (or sandstone) and gravel	--	--	--	
462	4/4-5C1	462	4/4-5C1	0	92	0.0	28.0	clay, red	Clay	--	--	--	Qh
462	4/4-5C1			92	98	28.0	29.9	gravel, water	Gravel	--	--	--	
462	4/4-5C1			98	155	29.9	47.2	clay, red	Clay	--	--	--	
463	4/4-16D1	463	4/4-16D1	0	70	0.0	21.3	tule mud	Clay and sand (or sandstone)	--	--	--	Qyal and Qoal
463	4/4-16D1			70	108	21.3	32.9	gravel and water	Gravel	--	--	--	
463	4/4-16D1			108	118	32.9	36.0	clay, gray	Clay	--	--	--	
463	4/4-16D1			118	130	36.0	39.6	clay, yellow	Clay	--	--	--	
463	4/4-16D1			130	141	39.6	43.0	clay, blue	Clay	--	--	--	
463	4/4-16D1			141	149	43.0	45.4	gravel and water	Gravel	--	--	--	

**Appendix 3.** Lithologic data.—Continued

[Site IDs and well number correspond to locations in Appendix 1, a site ID and well number is listed for each drilled interval for a particular drill hole. For convenience, the site ID and well numbers are repeated at the shallowest drilled interval for each well. leaders (--), not reported]

Site ID	Well number	Site ID, top of well	Well number, top of well	Top of interval, in feet	Base of interval, in feet	Top of interval, in m	Base of interval, in m	Reported lithologic unit <sup>1</sup>	Interpreted lithologic class <sup>2</sup>	Reported degree of cementation or induration <sup>3</sup>	Fossils reported in interval <sup>4</sup>	Organic matter reported in interval <sup>5</sup>	Reported stratigraphic top of geologic unit <sup>6</sup>
463	4/4-16D1			149	178	45.4	54.3	clay, gray	Clay	--	--	--	
463	4/4-16D1			178	182	54.3	55.5	gravel and water	Gravel	--	--	--	
463	4/4-16D1			182	216	55.5	65.8	clay blue	Clay	--	--	--	
463	4/4-16D1			216	219	65.8	66.8	gravel and water	Gravel	--	--	--	
463	4/4-16D1			219	228	66.8	69.5	cement, gray	Clay and gravel	cemented	--	--	
463	4/4-16D1			228	231	69.5	70.4	clay, yellow; and boulders	Clay and gravel	--	--	--	
464	4/4-16E1	464	4/4-16E1	0	52	0.0	15.8	tule mud blue	Clay and sand (or sandstone)	--	--	tule	Qh (?)
464	4/4-16E1			52	56	15.8	17.1	gravel, salty water	Gravel	--	--	--	Qyal and Qoal
464	4/4-16E1			56	93	17.1	28.3	tule mud, blue	Clay and sand (or sandstone)	--	--	tule	
464	4/4-16E1			93	99	28.3	30.2	gravel, salty water	Gravel	--	--	--	
464	4/4-16E1			99	138	30.2	42.1	tule mud, blue	Clay and sand (or sandstone)	--	--	tule	
464	4/4-16E1			138	143	42.1	43.6	sand	Sand	--	--	--	
464	4/4-16E1			143	164	43.6	50.0	gravel	Gravel	--	--	--	
464	4/4-16E1			164	239	50.0	72.8	tule mud, blue	Clay and sand (or sandstone)	--	--	tule	
464	4/4-16E1			239	241	72.8	73.5	sand	Sand	--	--	--	
464	4/4-16E1			241	279	73.5	85.0	clay, sandy, yellow	Clay and sand (or sandstone)	--	--	--	
464	4/4-16E1			279	280	85.0	85.3	gravel, coarse, fresh water	Gravel	--	--	--	
464	4/4-16E1			280	301	85.3	91.7	sand, coarse, fresh water	Sand (or sandstone) and gravel	--	--	--	
464	4/4-16E1			301	306	91.7	93.3	clay	Clay	--	--	--	

<sup>1</sup>Lithology transcribed exactly from driller's descriptions, as published in the three Water-Supply Papers.

<sup>2</sup>Assignment of interpreted lithologic class explained in table 2.

<sup>3</sup>Degree of cementation transcribed exactly from driller's descriptions, as published in the three Water-Supply Papers.

<sup>4</sup>Description of fossils transcribed exactly from driller's descriptions, as published in the three Water-Supply Papers.

<sup>5</sup>Presence of organic matter transcribed exactly from driller's descriptions, as published in the three Water-Supply Papers.

<sup>6</sup>Top of stratigraphic units listed as published in the three Water-Supply Papers; units queried as in original publications. Abbreviations of stratigraphic units and deposits: KJu, Franciscan and Knoxville Formations, undifferentiated; Qal, Alluvium; Qh, Huichica Formation; Qoal, Older alluvium; Qt, Terrace deposits; QTc, Continental deposits; QTge, Glen Ellen Formation; QTm, Merced Formation; Qyal, Younger alluvium; Tp, Petalum Formation; Tsv, Sonoma volcanics, undifferentiated. Blank cells imply the same stratigraphic unit unit as the overlying formation top.